GAS JOURNAL

LIGHT . HEAT . POWER . BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

Vol. 203. 85th Year. LONDON, AUGUST 9, 1933. No. 3664. Price 1s.

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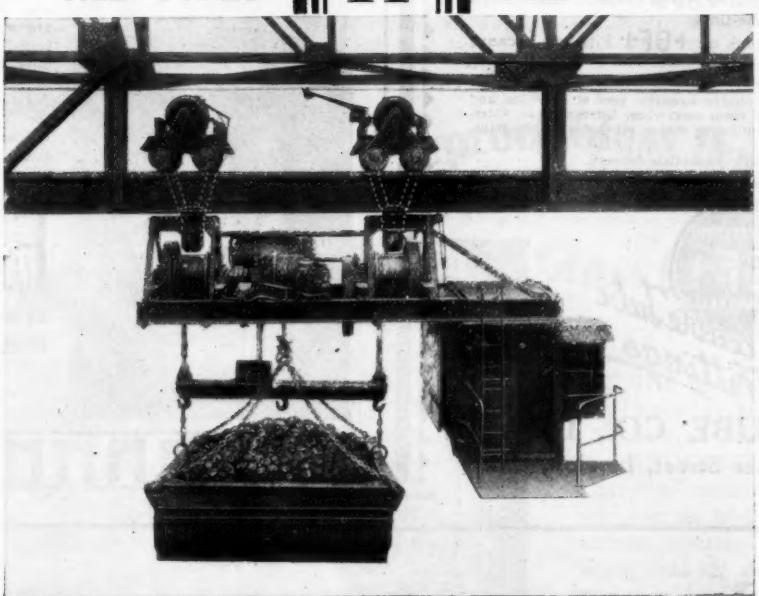

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For handling Coal, Coke, Oxide, etc., by means of Skips or Grabs.

The illustration shows a 7-Ton Gross Load, three barrel machine for handling coke from Intermittent Vertical Retorts.

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Salesmen's Demonstration Meter

This meter is invaluable to Salesmen for demonstrating the gas consumptions of various appliances such as cookers, fires, boiling burners, etc.

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For Marathon tests the meter is provided with a 3-circle index reading up to 1000 cubic feet.

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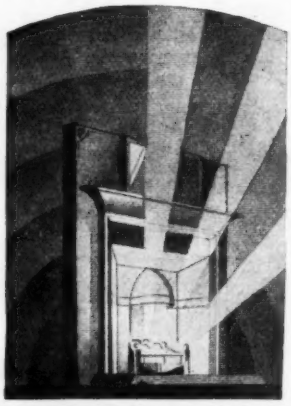
In Art-Metal—for Gas Fires!



Turner's Art-Metal Surrounds will add distinction and charm to any room where they are fitted.

Designed in a variety of styles and in attractive finishes, they are unexcelled in artistic beauty, sound workmanship and intrinsic quality.

All types of gas fires are provided for in our range, and they are easy to fix, many patterns being adjustable to any mantel opening.

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The Oughtibridge Silica Firebrick Co., Ltd.
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Put these in your Showrooms

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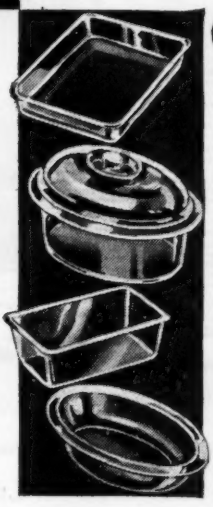

Glass Ovenware

THIS up-to-date Vulcan Cooker is bound to make an instant appeal to your customers. The addition of an ARMOURPLATE GLASS door is a practical improvement, for it enables one to see the food in process of cooking, without opening the oven door and letting cold air rush in. The double glass door, heat-resisting and practically unbreakable, is constructed with an intervening air space, obviating condensation of moisture on the glass and maintaining an efficient insulation of the oven heat.

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The well-planned hot-plate contains three boiling burners and reversible griller. All taps have patent self-adjusting and centring injectors. The stove is finished inside and outside in "Ceramic" porcelain enamel, and is supplied complete with stand, plate-rack, splasher-plate, and chromium-plated towel rail.

And, as appropriate equipment for this modern glass-panelled Cooker, a set of four pieces of Orlak Fireproof Glass Ovenware is included.

VULCAN STOVES

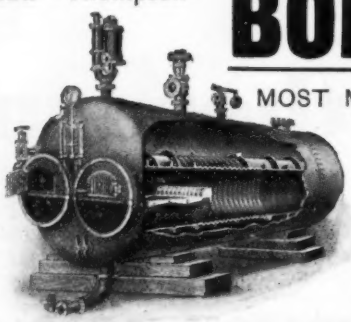
***The* VULCAN COOK BOOK**

Every housewife will want a copy of this inspiring Cook Book, as practical and attractive as the Vulcan Cooker itself. Send to us for a specimen copy and full particulars regarding this helpful sales aid.

THE VULCAN STOVE COMPANY LTD. EXETER

NEW "Thompson"

BOILERS EX STOCK



MOST MODERN "DISH-END" TYPE
WITH CORRUGATED SECTIONS
Standard Sizes in Stock
ALSO
WATER TUBE, CORNISH
AND VERTICAL BOILERS
SUPERHEATERS AND PIPEWORK

JOHN THOMPSON
"ECONOMIC"
BOILERS

JOHN THOMPSON (WOLVERHAMPTON) LTD.
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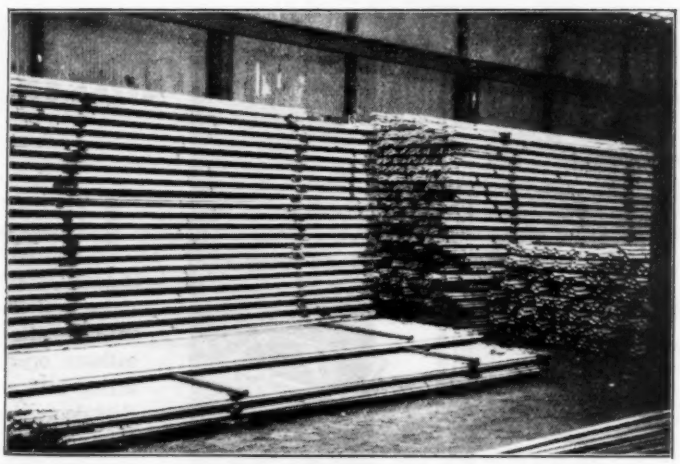
Tubes for the Gas Industry



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TRADE MARK.

Fig. 705. "SINGLE RAM" STEAM-PUMP.

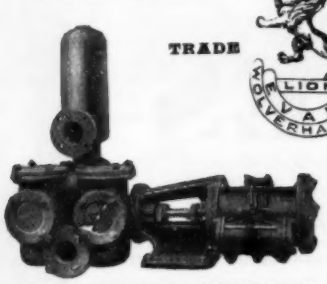


Fig. 588. "CORNISH" STEAM-PUMP FOR BOILER FEEDING, &c.

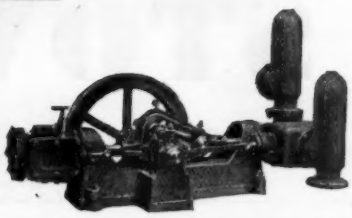


Fig. 685. "RELIABLE" STEAM PUMP FOR TAR AND THICK FLUIDS.

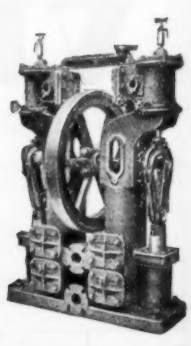


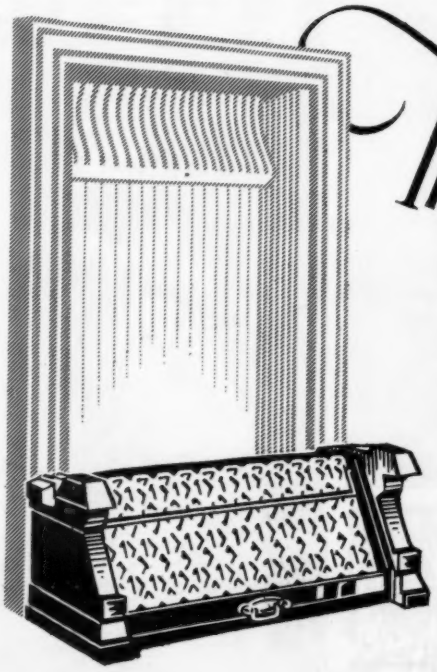
Fig. 712. "DOUBLE-RAM" STEAM-PUMP.

A NATIONAL CAMPAIGN
of *all-the-year-round*
advertising for the gas fire
that coal-fire "fans" *will* buy
STARTS on SEPT. 1st...

GOOD ADVERTISING
GOOD MEDIA

THE problem of obtaining gas load from that "die-hard" section of the public not yet converted to the use of gas fires, is solved by the "C.C." Fire.

By providing for the alternative use of gas, coke, or coal the "C.C." Fire makes an unique appeal . . . And those who instal it soon discover how well convenience is served, and the necessity for carrying and cleaning eliminated, by the whole-time use of gas.



The **C·C·FIRE**

PATENT NOS. 278115 . 314721 . 336824 . 336825

See that it features prominently in your showroom when the comprehensive National Advertising starts on September 1st.

All models are made to burn coke and are gas ignited.

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CLAYTON SON & CO LIMITED

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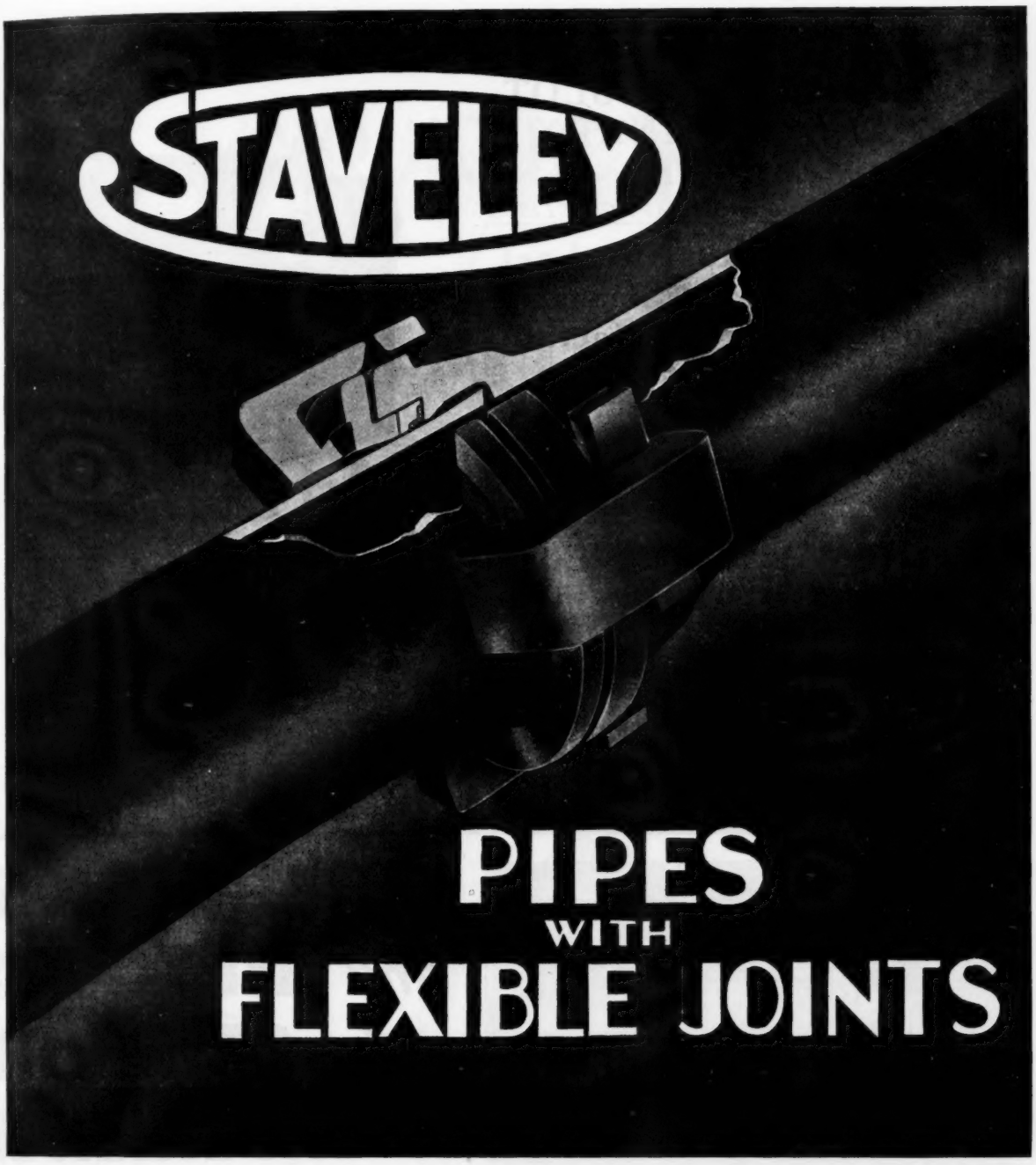
IN THE FAR EAST



Staveley Sand Spun Pipes represent British Foundry technique at its very highest pitch of perfection. Here are cast iron pipes free from cavities, blow-holes and dirt—pipes that are stronger, tougher, more elastic, and more resistant to shock.

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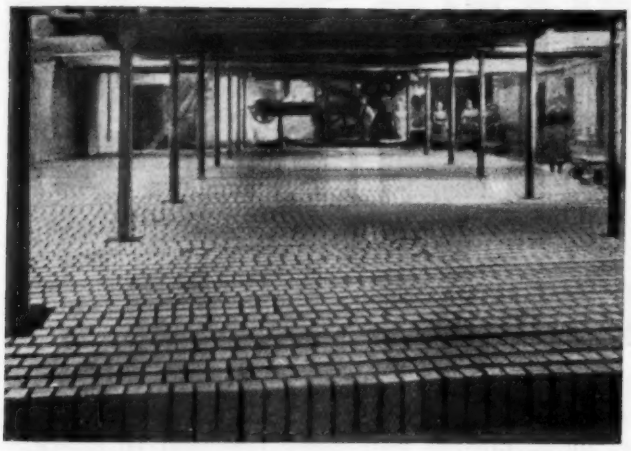

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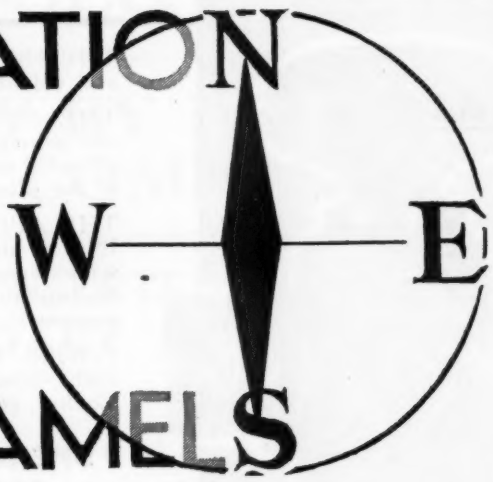

IN OUR ENAMELS
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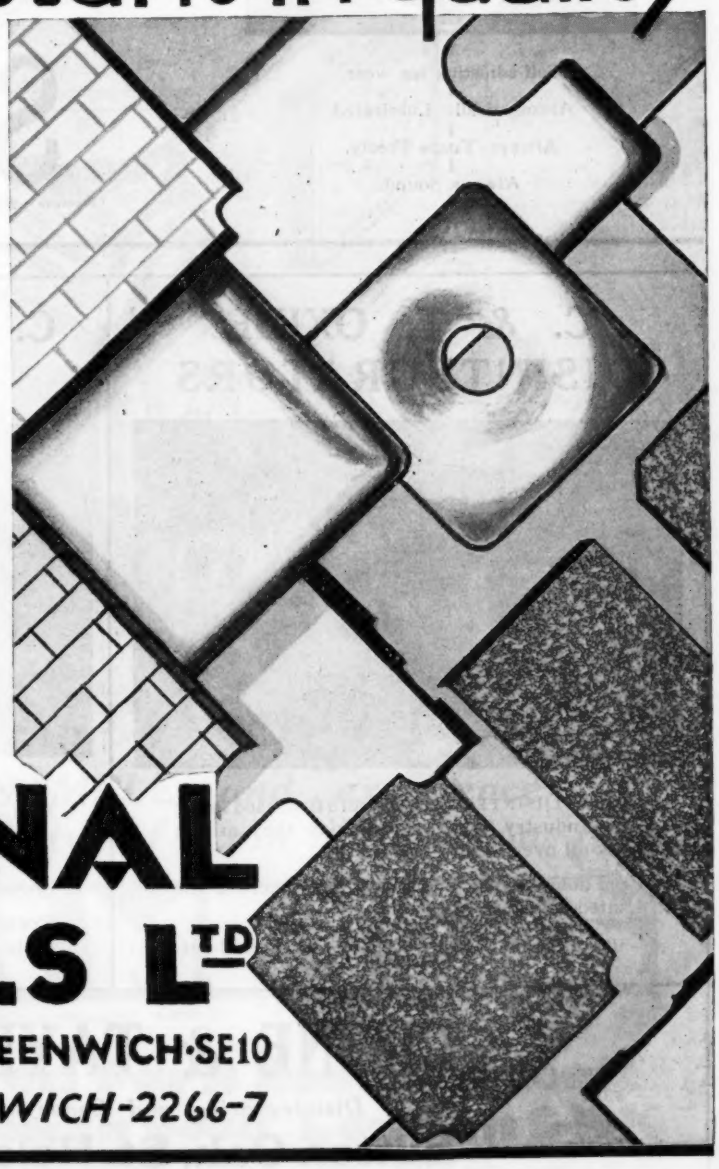

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"Constancy" is our watchword, and our linings, trays, and splash plates are noted for their excellence of quality, workmanship, and design.

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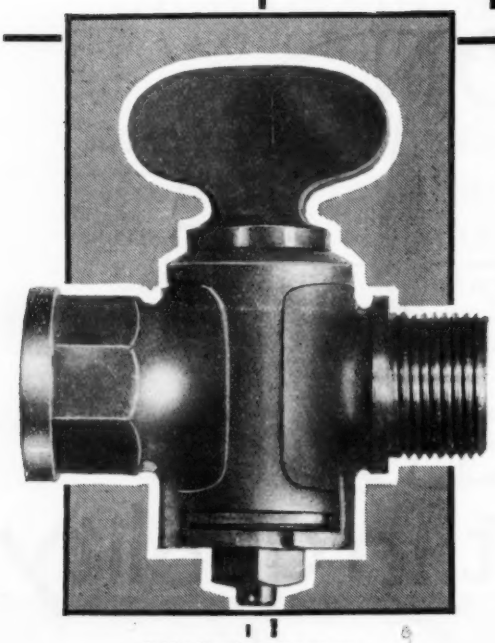
THE GAS COCK YOU SHOULD USE



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Always Turns Freely.

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THE APPLICATION OF THE SPRING LOADING to the plug is carried out in a special manner, which ensures that the plug is always retained on its bearing at a uniform pressure. Dismantling is never necessary.

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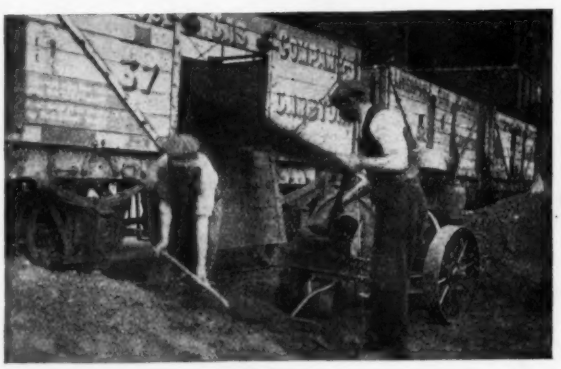

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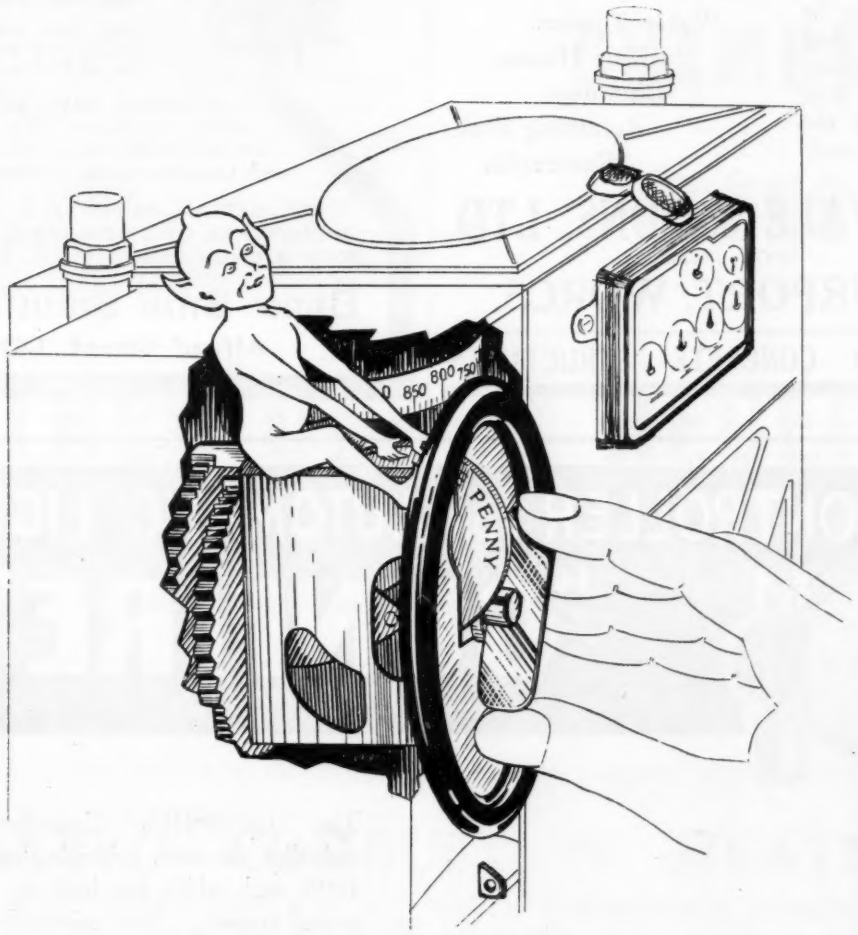

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WE SPECIALISE IN ALL THE REQUIREMENTS OF THE STEAM, GAS, AND WATER ENGINEER.

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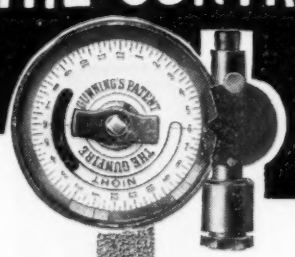

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AUTOMATIC LIGHT CONTROLLING Co., LTD.,
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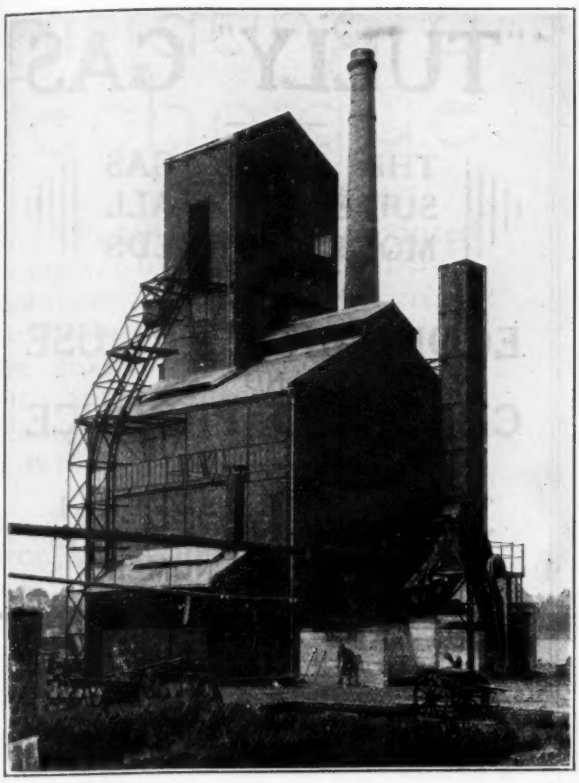

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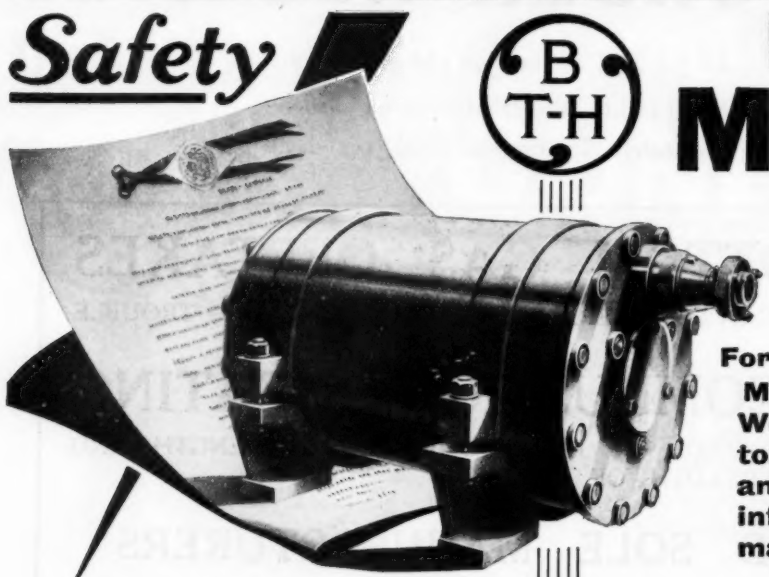

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No gas fire has aroused so much professional interest. The reaction upon the use of gas for heating is obvious.

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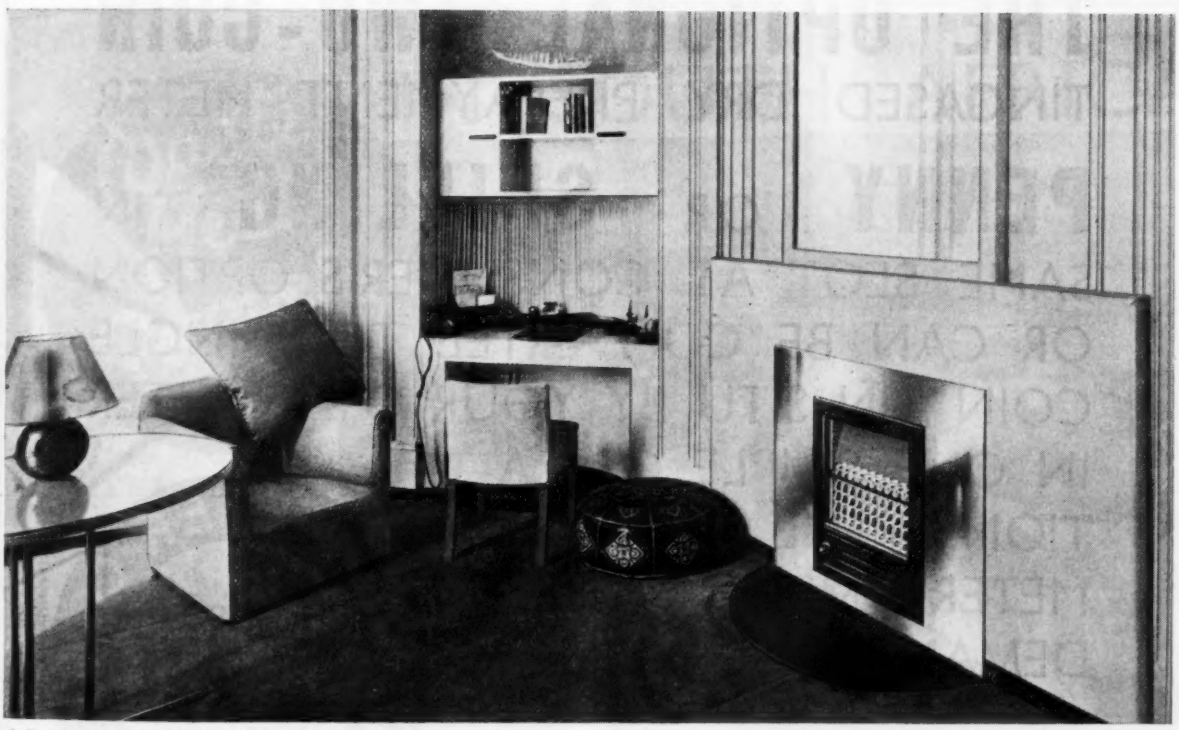

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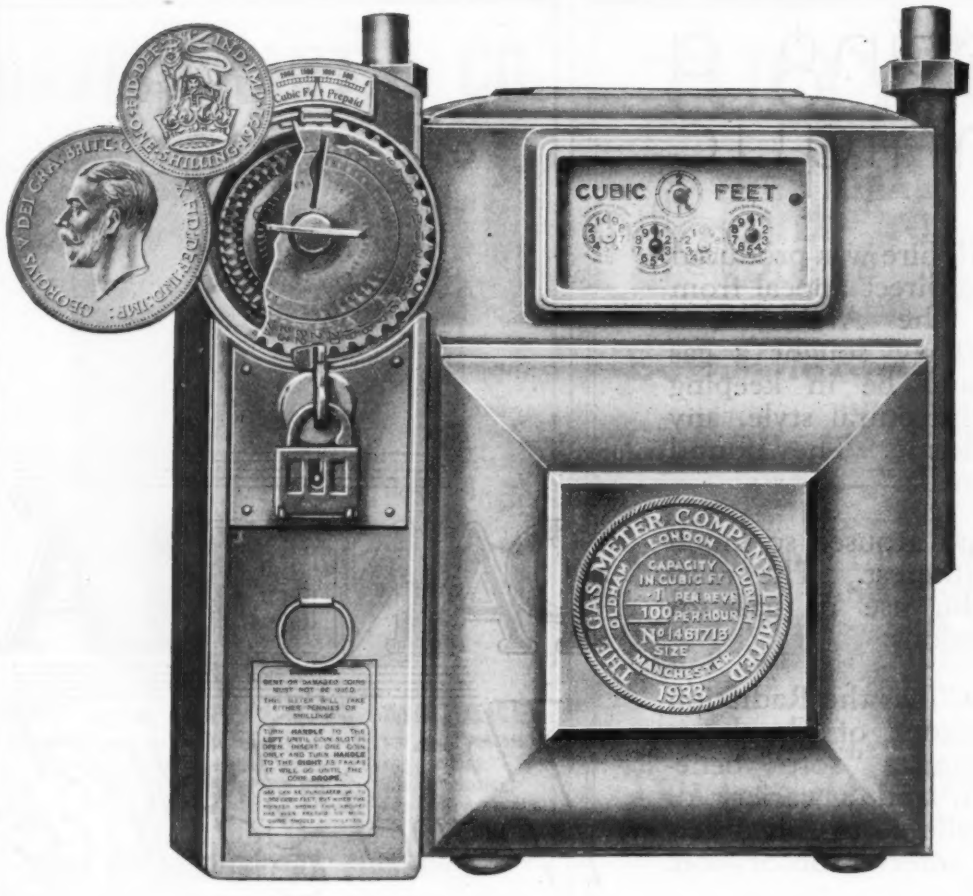

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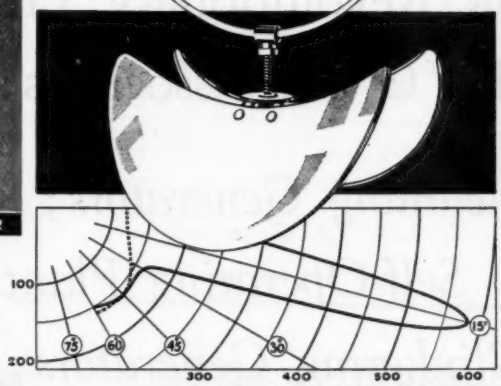

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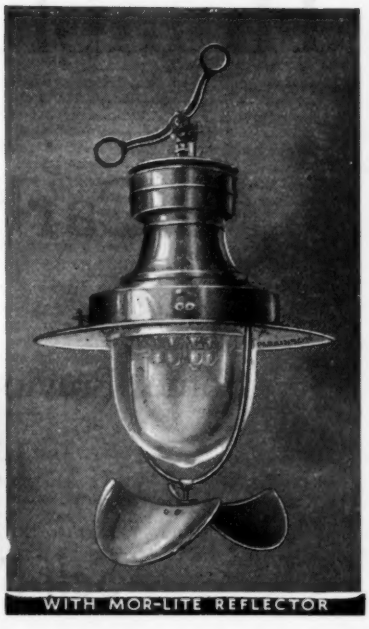
GRAPH SHOWING POLAR CURVE COMPARISONS FOR TWO LIGHT LAMP



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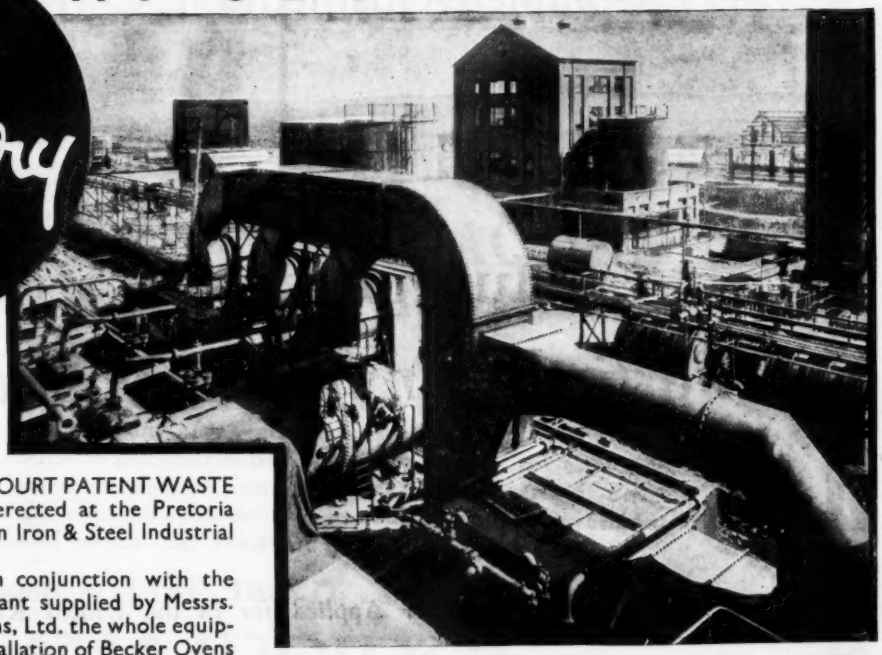

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THE GAS JOURNAL

AUGUST 9, 1933

Vol. 203. 85th Year No. 3664

A Glance at the Contents—

Gas Manager Required.

A Lancashire Gas Company invites applications for the position of Manager. [p. 311.]

The Klönne Dry Gasholder.

An interesting contribution on the subject of the Klönne dry gasholder is made by Mr. W. Beswick, Managing Director of Messrs. Ashmore, Benson, Pease, & Co., Ltd. [p. 297.]

Gas for Internal Combustion Engines.

Before the Summer Meeting of the Institution of Mining Engineers at Edinburgh, Dr. C. M. Walter made some interesting remarks regarding the application of town gas for the running of high-speed internal combustion engines. [p. 302.]

From University to Business.

The close of the second teaching year in the Department of Business Administration at the London School of Economics marks the successful completion of a further stage in training for business management and the beginning of a new and important development in the recruiting of trained men to industry and commerce. [p. 295.]

Kitchens on Wheels.

A very ingenious display was arranged by the Wandsworth and District Gas Company on the occasion of the Sutton and Cheam Hospital Carnival. [p. 305.]

Scholarships Awarded.

The Senate of the University of Leeds have, on the recommendation of the William Cartwright Holmes and Corbet Woodall Scholarships, awarded these scholarships. [p. 294.]

French Gas Congress.

Published to-day is a review of the proceedings at the 56th Congress of the Union Syndicale de l'Industrie Technique du Gaz en France, which was held from June 26-30 at Biarritz under the Presidency of M. G. Vautier. [p. 300.]

Coal-Gas Vehicles and the Finance Act.

Attention has already been drawn to the amended rates of motor vehicle duties which are imposed, as from Jan. 1 next, by Section 25 of the Finance Act, 1933, and we publish to-day in accessible form a comparison of the various rates operative in the case of differently propelled vehicles. [p. 304.]

Forthcoming Engagements

Aug. 15.—IRISH ASSOCIATION.—Annual Meeting at Waterford.

Sept. 4-7.—ASSOCIATION OF PUBLIC LIGHTING ENGINEERS.—Tenth Annual Meeting and Conference at Margate.

Sept. 5.—S.B.G.I.—Meeting of Council, 2.30 p.m.

Sept. 7.—NORTH BRITISH ASSOCIATION.—Annual Meeting in Paisley.

Sept. 12.—NATIONAL GAS COUNCIL CENTRAL EXECUTIVE BOARD. There will be no meeting of the Board during the month of August.

Sept. 21.—WALES AND MONMOUTHSHIRE ASSOCIATION.—Meeting at Porthcawl.

Sept. 25-27.—B.C.G.A.—Annual Conference at Bournemouth.

Nov. 7-8.—I.G.E.—Autumn Research Meeting.

Nov. 9.—S.B.G.I.—Autumn General Meeting, Hotel Metropole, London.

1933 "JOURNAL" Directory.

Page 72.—WEST BROMWICH. J. H. Rioch appointed Engineer and Manager vice J. W. Allin, deceased.

EDITORIAL NOTES

French Gas Congress

WE publish to-day a review of the 56th Congress of the Union Syndicale de l'Industrie Technique du Gaz en France, from which it will be gathered what a wide field was covered by the Reports of Committees and papers presented. One of the happy features of the congress, which was held under the Presidency of M. M. G. Vautier, was the award to M. A. Pignot of a prize of 5000 francs in recognition of his important work on the use of compressed gas for motor vehicles. In connection with this development of gas usage, M. E. Wibratte, in a paper describing instruments which may be employed in the physical control of gas quality, discusses the employment of the Löffler explosive calorimeter which enables the calorific value of very small samples of gas to be rapidly determined. Besides being used by a large gas association for tuning-up the carbonizing plant in its various small works, it has proved valuable in motor rallies, since it was possible to carry out rapid tests on the calorific value of the different gases supplied to the vehicles. A modified apparatus enables, in addition, the upper and lower explosion limits to be determined, and is of use in the study of the combustion characteristics of gases.

It is good to hear of the progress which is being made in France in the adoption of gas for cooking purposes in large kitchens. The use of gas in a military hospital in Paris formed the subject of a paper by M. G. Reclus, who indicated that in the last three years 89 all-gas kitchens providing meals for 15,000 people have been installed in institutions in Paris. The hospital with which the paper deals serves, on an average, nearly 600 people per day with a daily gas consumption of approximately 6300 c.ft. Another highly interesting contribution, by M. B. Delaruelle, is concerned with cylindrical pressure holders, and in particular with an installation of three such holders at Villeneuve-Sainte-Georges. These holders are 38 ft. 6 in. long and have a diameter of 10 ft., and their total available capacity at 100 lbs. per sq. in. is 60,000 c.ft. This, of course, is small-scale work compared with the pressure holder at Skipton, an account of which was given in the "JOURNAL" for June 28 last. At a pressure only half that employed at Villeneuve-Sainte-Georges, the Skipton holder is able to store 250,000 c.ft. On the other hand, it does indicate a growing appreciation of the special merits of this type of storage—up to a limiting capacity—where the ground is unsuitable for tank holders or where the holder forms part of a high-pressure distribution system.

Many points of practical utility were brought out in the papers. The precautions to be observed in the use of Junkers calorimeters illustrate this. And M. M. Fourmanoir describes a new type of consumers' meter designed by the Sigma Company, which "may constitute the first member of a rational series of meters."

Oil-Coal Fuels

A SESSION of the World Petroleum Congress held in London last month was devoted to a discussion of the problems and possibilities of using solid and liquid fuels—coal and oils—in intimate admixture for industrial steam raising and the generation of power in the internal combustion engine. The General Reporter of the Session was Dr. R. Lessing; and his valuable summary was published in the "JOURNAL" last week. Dr. Lessing has long studied the technicalities involved in the commercial exploitation of oil-coal mixtures, and he is therefore in a singularly good position to give advice as to how the problem should be tackled and to bring to bear a correct focus on the present state of affairs. He remarks that the scientific or quasi-scientific papers published on the subject are largely concerned with stabilizers, fixateurs, protective colloids, and in many cases suffer from the element of secrecy apparently introduced not to avoid disclosure of knowledge, but to hide ignorance. What seems to be a vital question, the suitability of specific types of coal and oil and their compatibility, has barely been touched upon. Many papers and articles in the Technical Press, he observes, are concerned with comparisons of monetary values of coal, oil, and their mixtures. Such discussions must be considered premature, so long as the technical problem of the preparation of these fuels, satisfactory in every respect, and applicable on a very large scale, has not been definitely solved.

On the other hand, since reawakened interest in the subject in 1932, much progress has been made; and there is good reason to anticipate that in the near future oil-coal mixtures will be more extensively employed. Plant for coal pulverization has been greatly improved of recent years and has been more widely adopted. Stabilization of oil-coal mixtures has become a more practical proposition, as is proved by recent trials on quite a large scale. And the advantages of employing what may be termed fluid coal are being better appreciated. Among the advantages of oil-coal mixtures which have great appeal are that the bulk weight of an oil-coal mixture is higher than that of either coal or oil, and the calorific value per unit volume is also superior to either fuel by itself; ignition is usually effected at a lower temperature or compression than when oil is used alone; and the density of the mixture is higher than that of water, and thus the fire hazard is lower than with oil. Above all, the use of oil-coal mixtures permits home-produced solid fuels to be substituted for at least some of that portion of the fuel requirements of a country which for technical or other reasons must be supplied in fuel form. Moreover, promising work has been carried out in Germany in which only coal and a coal oil were employed in the preparation of the fuel; and in this regard the dispersion of coal in a coal tar oil does not present the same difficulties as the use of a petroleum oil as the carrying medium. In any case a suitable coal, as low as possible in ash, should be the starting-point; and on this question of suitability more knowledge is needed.

Unemployment Grants

MORE than usual interest attaches to the recently published eleventh report of the Unemployment Grants Committee (Command Paper No. 4354) in that it is the final record of a splendid achievement of public service under the Chairmanship of Viscount St. Davids, C.B.E. The Committee were appointed in December, 1920, for the purpose of selecting the schemes to be assisted by financial support from the Government; and while no statistics are available of the total number of schemes submitted to them, grants in connection with work to a total value of £190,000,000 were approved during a period of less than twelve years. Of this total nearly £4,000,000 was approved in respect of revenue-producing work in connection with gas supply.

Notwithstanding the assistance thus rendered to the Gas Industry, and the appointment, during the later stage, of Sir William Whyte, O.B.E., to the Committee, it may be doubted whether public utilities in general would have been so concerned in the work of the Committee had it not been for the appeal finally taken to the House of Lords by the Seaham Harbour and Docks Company to contest the view of the Inland Revenue

Authorities that these grants were in the nature of income liable to income-tax. After many vicissitudes, the Company were successful in obtaining a final ruling in their favour, and acknowledgment has already been made in these columns of the public-spirited action which has enabled gas and other public utility undertakings to derive full benefit from the grants of the Committee, in that sums received could be expended without liability to income-tax attaching thereto.

Now that the full facts are available, there can be nothing but praise for a body of men who devoted their time and business acumen to sifting the various proposals brought before the Committee, and who unostentatiously held the scales fairly between the promoters of such schemes and the claims of the national finances coupled with the demand for reduction in the disposal of public money.

Rates and Ratepayers

APATHY of ratepayers towards local government matters is far too frequently met with, and anything that may increase the interest of the public in a subject which so closely concerns them is to the good. It is for this reason first of all that we welcome a small book just published at the price of 1s. net, to which the author, Mr. W. Ivor Jennings, M.A., LL.B., Reader in English Law at the London School of Economics, has given the title of the "Riddle of the Rates." The book, it may be added, is published by "The Local Government Chronicle," 227-239, Tooley Street, London, S.E. 1. In a foreword, Mr. Ernest M. Dence, Chairman of the London County Council, points out that in very many ways the local authorities are striving for the common good, "and yet Mr. John Citizen, much as he may and does grumble on receiving his rate demand, cannot stir himself to take interest in the actions of the elected representatives on the authorities for whom his money is required. Not only does he fail to give praise where praise is due for good work performed, but, even more important still, he does not trouble to see that responsibility for neglect or maladministration is brought home to those concerned." The London County Council itself provides irrefutable justification of a charge of apathy on the part of ratepayers. The largest local authority in the world, this Council is the central local government authority in an area of 117 square miles, with a population approaching 4,500,000 persons, and expends something like £40,000,000 of public money a year. Its staff numbers 86,000 persons, and its annual revenue exceeds that of some sovereign States. Yet at the last election of London county councillors, in 1931, out of a total electorate of 1,954,000 persons in contested divisions, not more than 543,000 recorded their votes.

Mr. Jennings's book is written for the enlightenment of the public, and should be widely read, in which event greater interest may be manifested in future council elections. But in the seventeen concise chapters of which the book is composed, is there any explanation of why Mr. John Citizen's elected representatives should hand him a rate "demand?" If the author is correct in his assumption that the average man or woman pays rates with even less enthusiasm than taxes, might not something be done to improve this state of affairs by the introduction of a more friendly looking word than "demand?" Why anyone should prefer taxes to rates, it is hard to say definitely. But there is something more personal about the latter; and it is, perhaps, because—in the smaller places, anyway—we are all acquainted with the people who are able to "demand" our rates, consequent upon the positions to which we have elected them, that the method of approach may seem to us to fall somewhat short of the ideal. Again, taxes rain in the same ratio upon all who are liable to pay them, whereas, according to locality, rates may range from anything to anything in the pound. Shall we say from about 7s. to about 25s.? This may, in certain cases, engender a feeling of "inequality," irrespective of soundness of the reasons for the wide divergence.

This, however, is by the way. Mr. Jennings has marshalled his facts in very readable form, and if the result should be to induce greater interest on the part of ratepayers in local affairs, his work will have been well worth while. The author has sought, to good purpose, to justify local government to the ratepayers.

Local Expenditure

WHILE writing the above, we have before us some figures from the Annual Report of the Ministry of Health for 1932-33, which has been issued by H.M. Stationery Office at the price of 5s. In addition to the detailed record of the Department's work during the year, some topic of general interest to students of public health and local government is usually chosen for special discussion. In accordance with this custom, last year's Report contained an analysis of the nature and growth of the capital indebtedness of local authorities throughout the past half-century. The present Report continues the discussion by examining the total figure of annual local expenditure, its steady growth, and the increasing proportion which has been defrayed from the taxes rather than from the rates.

It is found, comparing 1884-85 with 1930-31, that the total expenditure of local authorities has increased practically tenfold. In the 'eighties many local government services were in their infancy, but even as late as 1914-15 local expenditure was less than one-third of the figure for 1930-31. These comparisons, however, take no account of changes in the general price level. Within the last sixteen years the annual expenditure on highways, public health, and police services has practically trebled, that on education has more than doubled; while housing expenditure has multiplied thirty-fivefold. It must be remembered, however, that this expenditure is not all borne on the rates. The trading services (one-quarter of the whole expenditure) broadly pay for themselves, and there is also the enormous total of Government grants which come from the taxpayer. This last item has risen both absolutely and relatively.

The services with which the Ministry of Health is concerned involve a net total expenditure of over £126,000,000 a year, nearly £70,000,000 of which is on account of the Contributory Pensions and National Health Insurance Schemes, most of the income of which is derived, not from the Exchequer, but from the contributions of employers and employed. No fewer than 1,257,000 persons now receive contributory old age pensions, 618,000 widows receive widows' pensions, and allowances are paid in respect of 290,000 dependent children and orphans.

As the Government's policy on the vexed question of municipal economy, the Report states that this policy is "to aim at the progressive development of those public health services which are of urgent importance, and at the same time to avoid any expenditure on unnecessary items or the duplication of provision by overlapping services." The importance of preserving and improving the employability of able-bodied men on relief by providing work, training, or instruction for them is emphasized; and attention is drawn to the help which local authorities can render to the admirable movement for setting-up and maintaining recreational and occupational centres for the unemployed.

To Canada and U.S.A.

JUDGING by all the information at disposal, we agree with the Secretary of the Institution of Gas Engineers that there is every reason to believe that our forthcoming visit to Canada and the United States of America will be an unqualified success. Mr. Alexander tells us that the party now numbers 76—being 63 from Great Britain, 12 from France, and 1 from Switzerland—and what we know of those who are to be included affords absolute assurance that we shall have plenty of "good company."

The last date for the receipt of registrations for participation in the visit is Aug. 12, after which the registration fees of £1 1s. per participant cannot be refunded.

CORRESPONDENCE

The Wrottesley Clause.

SIR,—I understand that Mr. Ridley—who so ably represented the Gas "Company" interests on the Wrottesley Committee—is away on holiday, and I am therefore writing this (on the eve of my departure for a Cornish village which has no gas supply) at once to assure Dr. Carpenter in reply to the last paragraph of his letter, that the full significance of the diminished dividend proposals contained in the Wrottesley Clause was realized by the representatives of the Industry on the Departmental Committee responsible for the recommendations.

Yours, &c.,
A. W. SMITH,
General Manager and Secretary.
Birmingham Gas Department.

Council House,
Birmingham,
Aug. 8, 1933.

SIR,—It is difficult to follow Dr. Carpenter in his letter to the "JOURNAL," published last week, as to his method of computation of the Equivalent Discount for Dividend Authorization under the Wrottesley Clause.

It is equally difficult to interpret clearly the provisions of the Clause, and it seems that two constructions might be put upon it.

The Clause states that "the diminution in authorization proposed . . . may well commence to operate on discounts in excess of 30%." This is presumably intended to mean that if a discount of 40% is given, a diminution of authorization over the *whole* of the gas sold at such a discount becomes necessary, because gas sold at that price is not in effect a dividend-earning proposition, and, therefore, the benefit to be passed on to the stockholders must be restricted. The remaining sub-sections of the Clause prescribe this limitation as under:

Discount.		Discount for Dividend Authorization.
Exceeding 30%	not exceeding 40%	"$\frac{3}{4}$ of what would normally be allowed"
" 40%	" 50%	"$\frac{1}{2}$ " " "
" 50%	" 60%	"$\frac{1}{4}$ " " "

One interpretation of the Clause may be as follows:

Discount Allowed.	Discount for Dividend Authorization.	Dr. Carpenter's Scale.
30	All = 30	30
31	$\frac{3}{4}$ of 31 = 23·25	19·3
35	$\frac{3}{4}$,, 35 = 26·25	22·3
40	$\frac{3}{4}$,, 40 = 30	26·1
41	$\frac{1}{2}$,, 41 = 20·5	12·6
45	$\frac{1}{2}$,, 45 = 22·5	14·6
50	$\frac{1}{2}$,, 50 = 25	17·1
51	$\frac{1}{4}$,, 51 = 12·75	0·9
55	$\frac{1}{4}$,, 55 = 13·75	1·9
60	$\frac{1}{4}$,, 60 = 15	3·2

If this interpretation is the correct one, it would seem to show that a Company giving a 40% discount is not too far removed from dividend-earning power and may pass the benefit on to its stockholders as if it were giving a discount of 30%, but a Company giving a discount of 60% has cut the price so fine as to be able to earn scarcely more than, say, its cost of gas into holders, and therefore it can only pass on to its stockholders the equivalent of a reduction of 15%.

Even on this interpretation, however, anomalies arise, since from the figures in the above table a Company giving a discount of 31% can benefit its stockholders as if it were selling at a discount of only 23¼%, whereas if it gives a discount of 50%—*i.e.*, a price of less dividend-earning power still—it can treat its price for dividend as if it were selling at a discount of 25%.

The only other interpretation, therefore, appears to be that mentioned by Dr. Carpenter in the second paragraph of his letter, which in his opinion cannot be read into the Clause as drafted.

On this interpretation the scale would be as follows:

Discount Allowed.	Equivalent Discount Allowed for Dividend Authorization.		Dr. Carpenter's Scale.
30	30	..	30
31	30 plus $\frac{3}{4}$ of 1	30·75	19·3
35	30 ,, $\frac{3}{4}$,, 5	33·75	22·3
40	30 ,, $\frac{3}{4}$,, 10	37·5	26·1
41	30 ,, $\frac{1}{2}$,, 11	35·5	12·6
45	30 ,, $\frac{1}{2}$,, 15	37·5	14·6
50	30 ,, $\frac{1}{2}$,, 20	40·0	17·1
51	30 ,, $\frac{1}{4}$,, 21	35·25	0·9
55	30 ,, $\frac{1}{4}$,, 25	36·25	1·9
60	30 ,, $\frac{1}{4}$,, 30	37·5	3·2

Anomalies arise on this interpretation also, because it would appear quite illogical for discounts of 40%, 45%, and 60% to be all treated for discount for dividend authorization on the same basis—*i.e.*, equivalent to a discount of 37·5%. It also appears illogical (if the restriction on dividend authorization discount is imposed because of the loss of dividend-earning power on very low prices) for the dividend authorization discount to be 37½% where 60% discount is given, and only 30¾% where 31% discount is given.

On the other hand, it is to be noted that on this scale *all* the rates of dividend authorization discount lie between 30% and 40%, and as the Wrottesley Clause specifies that up to 30% discount no limitation for dividend is considered necessary, it might seem that this latter scale is the correct interpretation.

If, however, the *whole object* of the limitation is to prevent a company giving excessive discounts in order to benefit its dividend, the object would fail if a discount of 60% could be treated for dividend authorization as a discount of 37·5%.

On balance, therefore, the first scale appears to be the more likely interpretation, in which case a company giving a 60% discount could only treat that gas for dividend authorization as if it were giving a discount of 15%.

I must apologize for the length of this letter.

Yours, &c.,
HYDE C. BURTON, F.C.A.

5, Great Winchester Street,
London, E.C. 2,
Aug. 8, 1933.

PERSONAL

WILLIAM CARTWRIGHT HOLMES AND CORBET WOODALL SCHOLARSHIPS.

These scholarships have been endowed to enable a student to take a three or four years' course of study at the University of Leeds in preparation for a responsible position in Gas Engineering. They have just been awarded by the Senate of the University on the recommendation of the Cartwright Holmes and Corbet Woodall Scholarship Committees.

The Cartwright Holmes Scholarship has been awarded to RICHARD GRENVILLE PARKER, of Plymouth, at present junior technical assistant with the Plymouth and Stonehouse Gas Light and Coke Company. The successful candidate was at the Chapel Allerton High School in Leeds from 1917-1920 and continued his education at Ripon and at the Plymouth Technical College. While acting as a technical assistant to the Plymouth Gas Company he has continued his studies in Gas Engineering, and has obtained the Intermediate B.Sc. (London), Engineering.

The Corbet Woodall Scholarship has been awarded to J. CASTLE, at present junior technical assistant in the Brighouse Corporation Gas Department. J. Castle has been educated at the Rastrick Grammar School, and later for four years at the Bradford Technical College. He was an articled pupil of the Brighouse Gas Department, and has passed several examinations of the Institution of Gas Engineers.

* * *

The West Bromwich County Borough Council have approved the recommendation of the Gas Committee that Mr. JOHN HUNTER RIOCH, at present Chief Assistant Gas Engineer and Manager to the City of Stoke-on-Trent, be appointed Engineer and Manager of the Corporation Gas Undertaking at a commencing salary of £600 per annum. Mr. Rioch, who is 35 years of age, served his articles with the Gas Engineer and Manager to the City of Dundee, and was subsequently appointed Technical and Engineering Assistant at Dundee. He was later Assistant Gas Engineer and Manager to the Inverness Corporation prior to obtaining his appointment at Stoke-on-Trent in 1927. He succeeds the late Mr. J. W. Allin at West Bromwich.

Obituary.—At the moment of going to press, we learn with regret that Mr. REGINALD WILSON FOSTER, Senior Partner of Messrs. E. Foster & Co., Coal Factors, of 21, John Street, Adelphi, W.C. 2, died last Saturday. The business will be carried on by the surviving Partners, among whom is now numbered Mr. Trotman Foster, Mr. Reginald Foster's son, who has recently been taken into partnership.

THE NEWS OF THE WEEK

The Portsmouth Gas Company announce the declaration of an interim dividend of 2½% on the 5% maximum stock and of 4% on the consolidated stock (both less income-tax).

The Issue by Tender of £30,000 4½% redeemable preference stock by the East Surrey Gas Company on Aug. 4 was heavily over-subscribed. Applicants tendering less than the price of £110 3s. were unsuccessful, and tenders at that price received a partial allotment. The average price realized was £110 9s. 2d. per £100 stock.

The East Surrey Gas Company announce that, as a result of the offer to shareholders of the Horsham Gas Company, Ltd., acceptances have already been received in excess of the minimum number required. The offer has therefore become effective.

The Half-Yearly Report of Fleetwood Gas Company shows expenditure of £3907, made up of £3000 for new buildings and plant, £528 for new mains and services, and £378 for new meters. The revenue account shows a profit on the half-year of £2317, reduced by debenture and loan interest to £1593. The dividend rates are 6% on preference stock and 7% on ordinary stock.

The Board of Trade is being asked for permission to erect plant for the production of gas for the use of tomato growers in Lanarkshire. The plant is to cost in the region of £80,000 and will provide work for many unemployed. The company promoting the scheme will be known as the Clyde Valley Gas Supply Company. The coal will be carbonized, so that smokeless fuel will also be obtained.

The Winchester Gas and Water Company announce interim half-yearly dividends as follows: On the preference stocks at the rates of £4, £5, and £5 10s.% per annum, less income-tax; on the consolidated ordinary stock at the rate of £5% per annum, less income-tax.

Trade Mark Law.—We have received from the Association of British Chemical Manufacturers, of 166, Piccadilly, W. 1, a copy of the Memorandum on British Trade Mark Law, drawn up by a Trade Mark Committee representative of the Chemical Industry, and used as the basis of evidence before the Board of Trade Committee on British Trade Mark Law and Practice. Copies can be obtained from the Association by persons interested at a cost of 1s. each.

Price Reductions in Scotland.—The Kirriemuir Gas Company are reducing the price of gas by 2d. per 1000 c.ft. The same reduction is announced by Airdrie Town Council. Maybole and Hamilton consumers are to receive a reduction of 2½d. per 1000 c.ft. While the Gas Committee of Ardrossan Town Council recommended a reduction of 5d. per 1000 c.ft., the Council decided on a reduction of 2½d. Kinghorn and Kirkcaldy report a lowering in the price by 3d. per 1000 c.ft. In Cupar a forthcoming reduction of 1d. will bring the price down to 3s. 6d. per 1000 c.ft. In addition, a discount of 5d. per 1000 c.ft. is to be given to consumers of 250,000 c.ft. and of 10d. per 1000 c.ft. to users of gas engines.

On the Greens.

Davis Gas Stove Company's Bowling Success.

The Bedfordshire County bowling championships were brought to a close on the Vauxhall Motors green on July 24, with the Davis Gas Stove Company winners of three of the four titles. This was the second time they had achieved the feat, the club championship, pairs, and single-handed events falling to them in 1919. Six years later they went one better by sweeping the board.

All the County titles have changed hands this year. Luton Town held the club and single-handed championships, and the Vauxhall the single rink and pairs.

The Davis bowls team, which won the county rink championship, comprised Messrs. J. Turnbull, S. Allen, W. Mabley, and A. Stewart. A. Stewart also won the singles championship.

Shipping, Engineering, and Machinery Exhibition.

The Shipping, Engineering, and Machinery Exhibition will be opened by Lord Stonehaven on Sept. 7, and will continue to Sept. 23.

Official visits will be paid on Sept. 8 by the Institution of Gas Engineers and the Society of British Gas Industries, and on Sept. 14 by the London and Southern District Junior Gas Association.

Maclaurin Plant to be Sold.

Glasgow Town Council decided at a meeting held on Aug. 3 to offer for sale the smokeless fuel plant which has been in operation at their Dalmarnock Works for a number of years. The plant, which works on the Maclaurin system of low-temperature carbonization, has been used to produce solid smokeless fuel which has been sold under the name of "Kincole."

There was considerable discussion in the city when the plant was closed down some time ago, but the Gas Department, who had already lost £80,000 in building and running this plant, felt justified in putting before the Council their decision to advertise the plant for sale.

From University to Business.

Appointments Offered.

The close of the second teaching year in the Department of Business Administration at the London School of Economics marks the successful completion of a further stage in training for business management and the beginning of a new and important development in the recruiting of trained men to industry and commerce.

Training the business executives of the future is a vital national task which has hitherto met with numerous difficulties. Especially in the case of university men, financial considerations, the necessity of full-time study, and uncertainty as to the future after training, have restricted the flow of trained men into industry, to the disadvantage of business, the individual, and the nation.

The Department of Business Administration is now making a practical contribution towards solving this problem by providing an essential missing link. Eight or ten nationally known firms, allied with the Department and subscribing to its funds, are offering definite jobs to men selected by them and trained by the Department. Candidates must be university graduates who have just taken their degree. Their personal qualifications must be high. They must defray themselves the moderate cost of the Department's specialized business course, which lasts for an academic year. But when their training is completed they will be assured of definite posts at salaries arranged in advance; and as they will be marked men in their concerns, their future will depend largely on themselves. This University Scheme thus offers the right man a new and notable opportunity.

This important development supplements the training already given by the Department to university graduates and others who possess the high educational requirements demanded by its course and who have the necessary practical experience in lieu of advanced studies. The Department of Business Administration was established at the London School of Economics in 1930 through the joint efforts of leading business firms and the School authorities. It is financed mainly by business subscribers and controlled by a Management Committee representative of business and academic interests. Its main work is to provide selected students with full-time training in the broad principles of business administration. The high academic standing of its course is shown by its recognition for certain degree purposes by the University of London.

During the past two years nearly forty students have been trained by the Department, half in the specialized business course and half in the preliminary evening course. Most of the students were university graduates and practically all were between 22 and 28 years old. Nearly half

THE NEWS—*continued.*

were seconded for training by firms allied to the Department, and at the end of each session there has been a keen demand for non-seconded students from firms wishing to recruit trained men.

The specialized business subjects which form the Department's main course comprise marketing, production, finance, and statistics, accounting, and personnel management as instruments of executive control. The Department has broken the greatest amount of new ground in the fields of marketing, retail management, and sales management, where the teaching is based on fresh investigation of current practice. Special efforts are made to keep the teaching in the closest touch with reality through discussions opened by business men and visits to factories, shops, and offices, and through the use in the marketing courses of the case method. Cases are actual business problems, which have been supplied by over a hundred firms.

Applications are now being received for admission to the next course, which begins in the autumn. Further information about this and about the University Scheme described above, together with application forms, may be obtained from Mr. Jules Menken, the Head of the Department, at 11, Clement's Inn Passage, W.C. 2.

The Lovibond Comparator.

In response to repeated requests for permanent colour standards for pH determinations, the Tintometer, Ltd., have co-operated with British Drug Houses, Ltd., in the production of a handy form of comparator in which the colour produced, on the addition of a measured quantity of indicator to the liquid under examination, is compared with permanent colours prepared with the well-known Lovibond glasses. These colour slides have been established by very careful comparison with solutions of known pH and B.D.H. indicators. While the manufacturers do not claim that the colours are in every case an exact match of the indicator colours, owing to the brightness of some of the latter, yet they are sufficiently close matches to enable correct identification of the various pH values to be made.

Ascot Water Heater Business Under Separate Name.

For some long while, Messrs. Cookers & Geysers, Ltd., of 244, High Holborn, W.C. 1, have felt the need for the name of their Company to be more representative of the goods manufactured. In consequence, the part of their business which concerns itself with "Ascot" gas water heaters has been merged with Messrs. Junkers & Co. (Gt. Britain), Ltd., under the name: Ascot Gas Water Heaters, Ltd.

This name has accordingly been officially registered, and the Company is now engaged in both the manufacture and the distribution of "Ascot" gas water heaters. The merger and change of name do not involve any change in the constitution, policy, or management of the Company. The new telephone number is Holborn 7107 (4 lines); and the telegraphic address, Gascot, Holb, London.

Theft of Gas and Bribery.

The News-sheet of the Bribery and Secret Commissions Prevention League gives an account of a case heard at the Central Criminal Court, on July 6, when Patrick James Barry, 32, salesman, of Penistone Road, Streatham, pleaded guilty to stealing a quantity of gas, the property of the South Metropolitan Gas Company.

He was further charged with corruptly offering a gift of money to Detective Hubert Iredale as an inducement to him to refrain from prosecuting him.

Mr. J. P. Valetta, prosecuting, said that accused had been a consumer of gas, which was cut off in February, 1932. Later the meter was removed on April 7 of this year. An inspector of the Gas Company called at the house and found gas being burned in the gas stove. The supply was then disconnected in the road. Subsequently Detective Iredale called on accused, who said: "This is to be kept out of court for a special reason." It was alleged that accused then offered the officer £5 for that purpose. The accused also said he did not care who was "pinched" so long as he got out of it.

Detective Iredale proved a previous conviction for obtaining charitable contributions by fraud at Reigate.

In passing sentence of four months' hard labour, the Common Serjeant (Mr. Holman Gregory) said that if the charge had been only that of stealing gas he might have done what any other magistrate would have done—bound accused over. But he attempted to corrupt a public official.

New Low-Temperature Carbonization Plant.

It is officially announced by the British Coal Refining Processes, Ltd., that their first plant will be erected on the outskirts of Huddersfield. Sources of coal supplies have been secured, together with sufficient land for future expansion. The B.C.R. process is founded on the Salerni system of low-temperature carbonization, and such highly successful results have been obtained on many different types of coal that it was decided to build this plant to demonstrate to the British coal industry the economic and commercial possibilities of the process. It is hoped that the results of this private enterprise on the part of Sir Eric Hambro will lead to the erection of large plants throughout the coal areas of Great Britain.

The Company's technical experts are also studying the question of hydrogenating the oil obtained from the coal. The plant has been manufactured in this country.

In an interview, Capt. Allan Kyle, Managing Director of the Company, said, "This is the outcome of three years' continual experiments and the results obtained in semi-industrial retorts. Nothing has been left to chance, and we are confident that the results of our first commercial plant will be a revelation to the coal industry."

Gas Chambers and Coke Ovens, Ltd.

Strong Financial Position.

The Chairman (Mr. B. J. Montfort Bebb), in his address to the shareholders at the Annual General Meeting of Messrs. Gas Chambers and Coke Ovens, Ltd., at the Offices of the Company, Artillery House, Westminster, S.W. 1, on Aug. 2, referred to the strong financial position of the Company, and also to the depressed condition of industry generally, resulting in very few new installations of the types exploited by the Company.

He referred in particular to the successful conclusion of the Company's contract for the first intermittent vertical chamber plant in the Dominion of Canada, which had given great satisfaction, and to the fact that the Company is already carrying out an extension to this plant. He also mentioned the business tour of Mr. Arthur H. Lymn, the Managing Director, throughout that Dominion last year. As regards prospects, he mentioned generally the imprudence of forecasting the future, but nevertheless sounded a hopeful note as regards the prospects in the carbonizing industry likely to result from improvement in trade generally.

The Directors' report showed that the profit for the period, after providing for Directors' fees, is £4397, to which has to be added the credit balance brought forward from last year, £1319, making a total available of £5717. The Directors recommended that this sum be appropriated as follows: In paying a dividend at the rate of 5% (less income-tax) on the preferred ordinary shares (gross); and in providing a reserve for income-tax of £550, leaving a credit balance to carry forward of £2154.

Signs of Improving Conditions.

While people on all sides are asking each other whether they see any signs of improvement in business, and many are replying that there is a better "feeling in the air," few have so far given facts to support their statements.

The Research Department of the Advertising Association, however, has just issued some remarkable figures which tend to show conclusively that the slump is at an end.

It has always been agreed that the first true sign of improvement would be an increase in the prices of raw materials. Here are a few which have shown a steady rise during the first half of 1933:

London Gold Prices per Unit.

	Dec., 1932.	June, 1933.
Cotton	7 to	8½
Wool	23 ,,	27
Sugar	5½ ,,	6
Tea	9½ ,,	11
Rubber	2½ ,,	3¼
Spelter	15⅝ ,,	17
Copper	30 ,,	over 38
Lead	11 ,,	13½
Tin	155 ,,	220

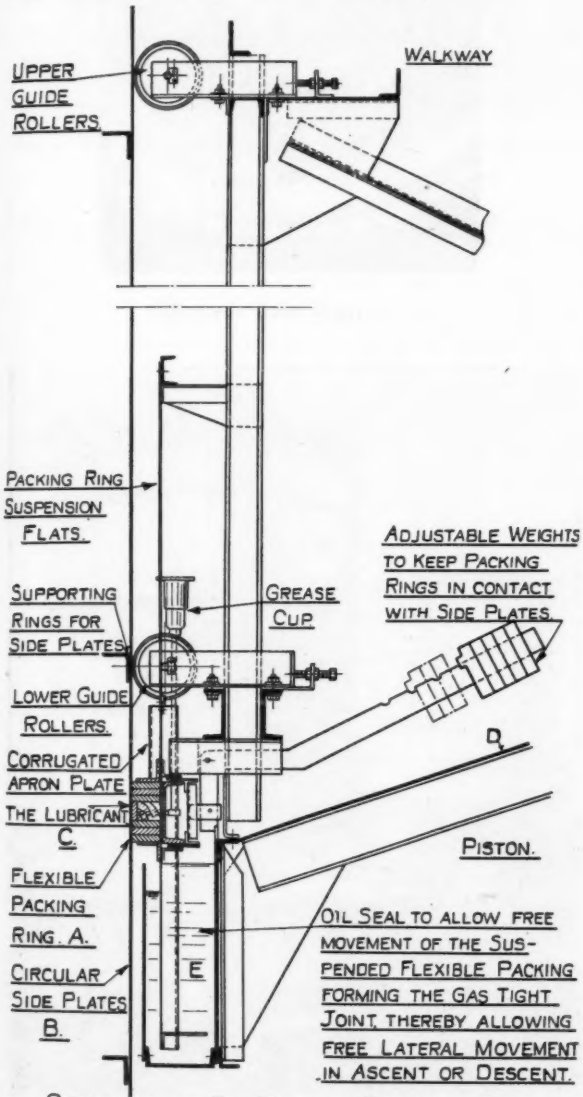
The Department has also examined the balance-sheets of some twelve hundred public companies issued during the period January to June. It is found that, while during the first half of 1932 only 377 companies showed increased profits, during the first half of 1933 no less than 539 companies—over 40% more—showed increased profits.

Among these companies, of those which can appropriately do so, the great majority consistently and persistently advertise their products.

THE KLÖNNE DRY - - GASHOLDER - -

A contribution by W. Beswick, Managing Director of Ashmore, Benson, Pease, & Co., Ltd.

The publicity given to the recent disastrous accident on a waterless holder in Germany has tended to create a certain amount of prejudice against waterless holders and to obscure the engineering achievements and the positive qualities and safeguards attached to this type of holder as designed and constructed on the most modern lines. The attention given to construction, design, and operation of gasholders in this country on the part of gas engineers and experienced builders constitutes the greatest safeguard and security for the public interest. No greater attention could be given than is the practice in this country.

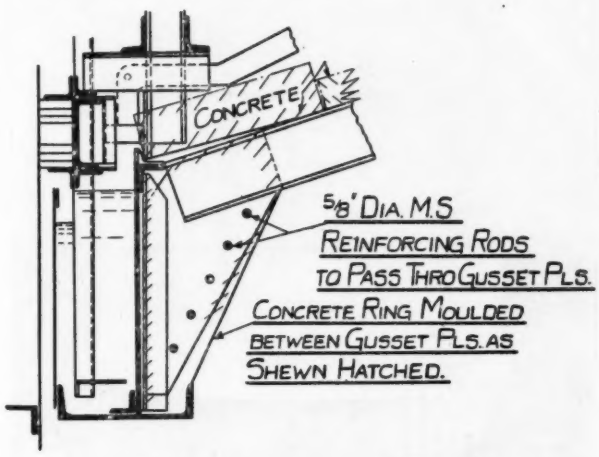

UPPER GUIDE ROLLERS
WALKWAY
PACKING RING SUSPENSION FLATS.
ADJUSTABLE WEIGHTS TO KEEP PACKING RINGS IN CONTACT WITH SIDE PLATES.
SUPPORTING RINGS FOR SIDE PLATES
GREASE CUP
LOWER GUIDE ROLLERS.
CORRUGATED APRON PLATE
THE LUBRICANT C.
FLEXIBLE PACKING RING. A.
CIRCULAR SIDE PLATES B.
D.
PISTON.
E
OIL SEAL TO ALLOW FREE MOVEMENT OF THE SUSPENDED FLEXIBLE PACKING FORMING THE GAS TIGHT JOINT, THEREBY ALLOWING FREE LATERAL MOVEMENT IN ASCENT OR DESCENT.

SECTION OF OIL SEAL & PACKING RING FOR KLONNE GASHOLDERS. FIG. 1

It is my opinion that the accidents which have taken place in waterless holders since their introduction have been due to the fact that these holders were representative of pioneer work and consequently were subjected to the unknown risks which lack of experience involves in such specialized work. It is felt that the present is an opportune time to give publicity to any facts and features of waterless gasholder design and operation which would tend to establish confidence and to show that pioneer difficulties have been overcome. Those who have been enterprising enough to sponsor this system of gas storage have practical illustrations to show of successful work done.

York's 2 Million c.ft. Gasholder.

The first Klönne waterless gasholder in this country was built for the York Gas Company by Ashmore, Benson, Pease, & Co., Ltd., who have had over sixty years' experience in building gasholders of all kinds. This holder has been at work since May, 1931.



METHOD OF PLACING PORTION OF CONCRETE BLOCKS UNDER PISTON FIG. 2

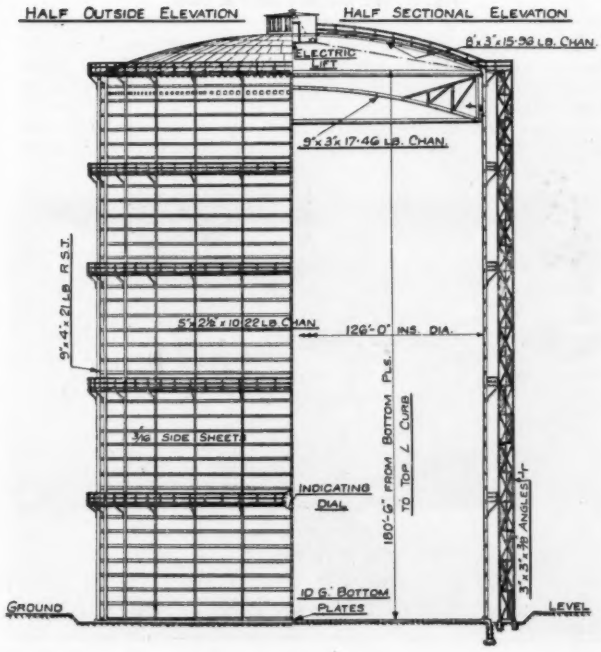


FIG. 3.

The details of design were subject to the approval of Mr. H. E. Bloor, B.Sc., B.Eng., M.Inst.Gas E., the Engineer and Manager of the York Gas Company, who has taken a most helpful and practical interest in its operation throughout.

This holder has a diameter of 126 ft. and height of 180 ft. 6 in. to the top gallery, the total height of the top of centre

turret being 203 ft. 6 in. The shell is cylindrical and is formed of curved steel plates riveted to vertical rolled steel joists which act as columns and to horizontal rings of channel section which act as joint covers to the plates and also as stiffeners.

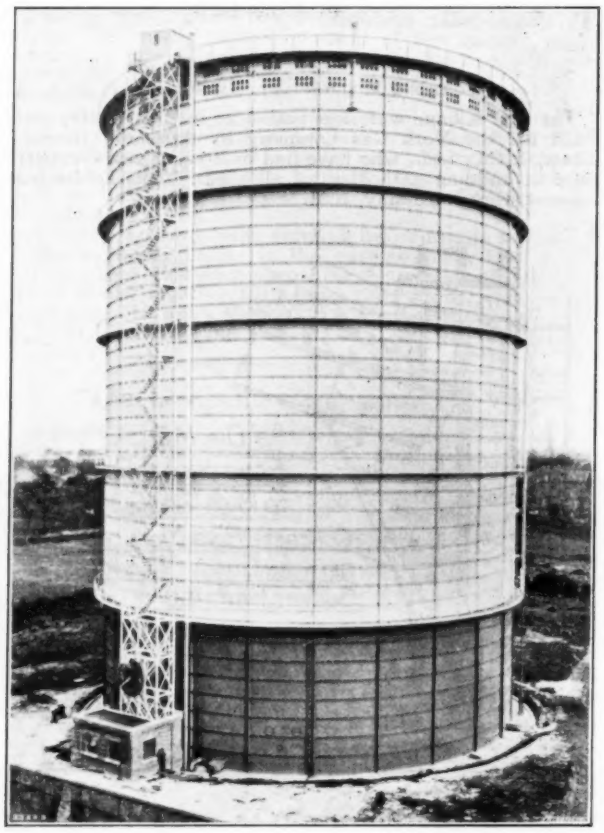


Fig. 4.—The Klönne Holder at York.

The rivets in the shell plates are all countersunk on the inside, and the heads having been finished off with a pneumatic grinder a smooth surface is presented to the packing ring of the piston.

At intervals of about 38 ft., balconies or galleries are provided. These are designed to serve as stiffeners against

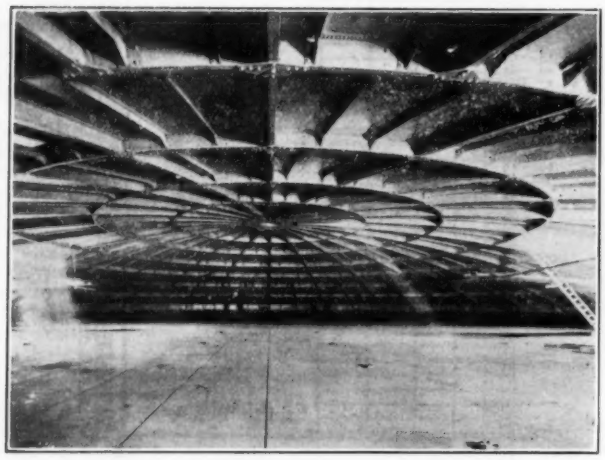


Fig. 5.—2 million c.ft. Klönne Gasholder. Piston Framing.

wind pressure and are also of use as inspection walk-rounds. Ventilation is provided by louvres placed in the top tiers of side plates of the holder and in the turret. Windows are fixed in the top tier and provide ample light for the inspection of the piston and the cylinder walls.

A self-supporting roof formed of channels and steel sheets provides protection from the elements. A turret at the centre of the roof carries louvre ventilators and acts as a means of entry to the electric lift.

As shown in fig. 3, access to the roof of the holder from the ground is obtained by means of a steel stairway to the turret, and the electric lift gives access to the piston crown.

At the base the holder is closed by steel bottom sheets resting on a concrete slab and connected to the cylindrical shell by internal and external angles.

The piston, like the roof, is dome shaped and is made self-supporting by a system of channel rafters and rings to which are riveted steel sheets. A view of the underside of the piston is shown in fig. 5.

Sealing System.—A flexible steel ring plate is suspended

Fig. 6.—Top of Holder from Below.

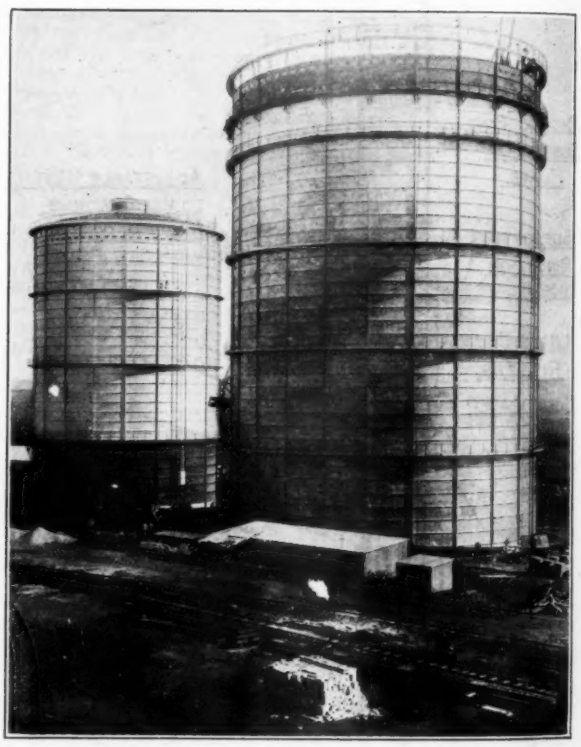


Fig. 7.—1 and 2 million c.ft. Holders for Pretoria.

from the framing carrying the top rollers and its lower end dips into the oil cup as shown in fig. 1. The piston packing is carried by this sheet ring and is pressed against the side by the levers so as to form a gas-tight joint, by the system of levers shown in the figure.

A large dial placed near the bottom of the holder indicates the amount of gas stored in the holder, the pointer being worked by a system of wires connected to the piston crown.

Operation.

The working of the holder has been eminently satisfactory. Experience over two years with hot and cold ex-

tremes of temperature and gales of hurricane force has shown that such a holder is easily adapted to local conditions, and that with systematic attention to lubrication and slight occasional adjustments of levers the piston remains gas-tight and acts uniformly throughout wide variations of weather, gas storage, and supply. The movement of the

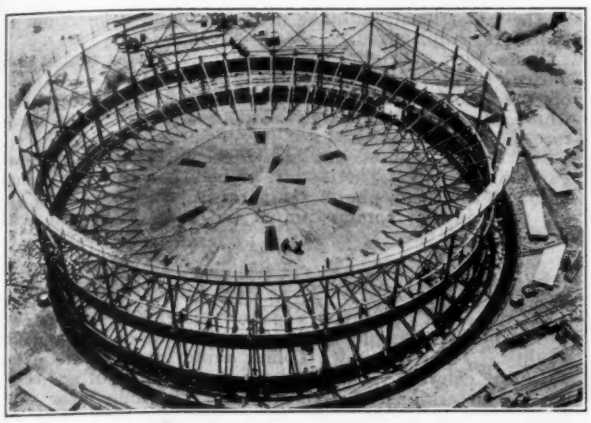


Fig. 8.—Bird's eye view of piston of 2-million c ft. gasholder in course of erection.

piston is indeed so remarkably smooth and steady as to be almost imperceptible with practically no variation from the horizontal plane.

All who have visited the York holder and who have been used to this type of holder have remarked upon the fact that there is absolutely no smell of gas to be traced when entering the space between the crown of the piston and the roof.

The pressure of the gas due to the weight of the floating piston is practically constant—careful adjustment during the earlier period of operation of the pressure exerted by the levers on the packing ring having resulted in only a small fraction of difference in the pressure during the up and down motions of the piston. No doubt the bedding-in of the packing ring has helped towards this even pressure.

Improvements.

The principal feature of improvement in the later design of the Klönne waterless holder is in the increased stability of the piston, its freedom of movement, and in its greater convenience of inspection. All the troubles which have arisen in the operation of waterless holders have been due to lack of positive seal and to undue tilting. Tilting occurs where there is irregular movement of the piston either from loss of sealing medium, lack of balance, or from local restraints of movement. Where the piston is properly designed and constructed with freedom of movement, a posi-

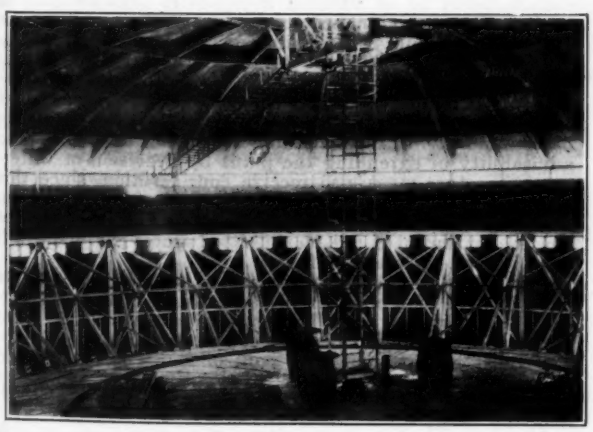


Fig. 9.—Interior of 1-million c.ft. holder at Pretoria.

tive and flexible seal, accessibility for inspection and greasing at all points, this type of waterless holder is as safe as any form of gasholder, and possesses in addition special advantages of its own. The records of operation over years of holders possessing these features prove both the reliability and advantages of the system.

Centre of Gravity Lowered.

An important factor in securing stability of the piston of the Klönne holder is to keep the centre of gravity low. This is attained by a proper distribution of the weight of the piston, partly through the steelwork and partly through the ballast required for the pressure. In earlier designs the whole of the ballast was placed on the top of the piston crown commencing at the periphery and extending as far towards the centre as the required pressure demanded. Now a considerable portion of the total concrete ballast is placed underneath the piston, thus lowering the position of the centre of gravity and removing any tendency on the

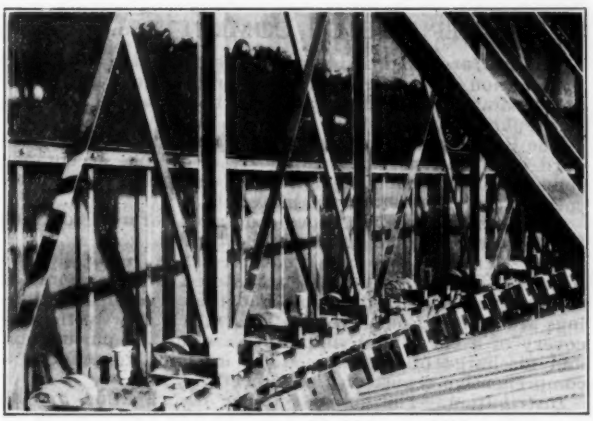


Fig. 10.—Lower rollers and levers of 1-million c.ft. holder for Pretoria.

part of the piston to tilt. The improved method of placing concrete ballast is shown in fig. 2.

Accessibility of Moving Parts.

A recent improvement is the placing of both rings of rollers above the piston as shown in fig. 1, thus admitting of inspection and adjustment of the lower ring as well as the upper. Formerly, the inspection of the bottom rollers was only possible when the holder was out of action. A further point is the increase of the height between the two rings of guide rollers, thus enabling the piston to rise and

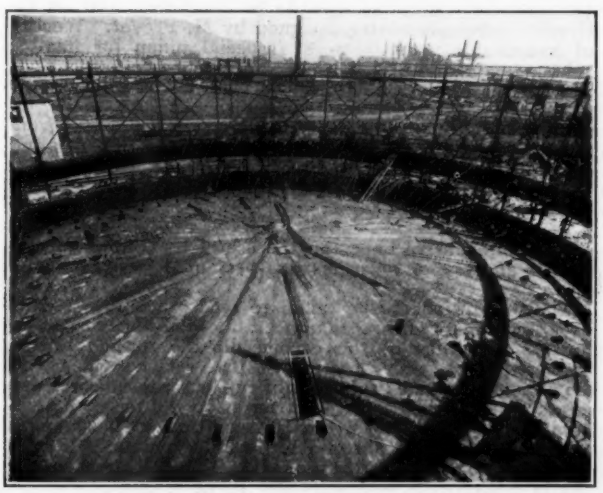


Fig. 11.—2 million c.ft. Klönne holder under construction at Port Talbot.

fall virtually level. The distance between the rings is now roughly one-seventh of the piston diameter.

The oil cup shown in fig. 1 allows unrestrained movement of the packing ring without leakage, and is considered by Ashmore, Benson, Pease, & Co., Ltd., to be superior to the fabric ring on some of the Continental holders.

The Klönne waterless gasholder lends itself admirably for adaptation for easy purging of gas and air both when filling and emptying. There are no explosion relief valves to be maintained.

Since the inception of the Klönne waterless holder in 1927 more than 50 of these structures have been erected, representing a total capacity of over 60 million c.ft., those of British design and construction having a capacity of 7 million c.ft.

FRENCH GAS INDUSTRY

Review of the 56th Congress of the Union Syndicale de l'Industrie Technique du Gaz en France

The 56th Congress of the Union Syndicale de l'Industrie Technique du Gaz en France took place between June 26 and June 30 in that delightful holiday resort, Biarritz. The President was M. G. Vautier.

We give below a summary of the reports and papers presented.

REPORTS OF COMMITTEES.

Manufacture.—A questionnaire was circulated asking for information as to the type of control exercised in small and medium-sized works. A report based on the replies is in preparation.

The Committee is engaged in the compilation of a standard specification for guarantee tests on and acceptance conditions for carbonizing plant. This will embody, also, specifications for refractory materials.

The present report includes a detailed form of contract for the order of a holder of simple type.

Tar, Benzole, and Bye-Products.—It is reported that serious difficulties have been encountered in many works in the disposal of effluent liquors and that several undertakings are carrying out investigations with a view to the discovery of a cheap and simple process for the purification and discharge of effluents. It is intended to prepare a comprehensive report on the subject.

Distribution.—The subjects under investigation by the Committee include pressure losses in the pipe services of consumers' premises, the standardization of unions, the causes responsible for the deterioration of rubber joints, and a revision of the rating of meters. Reports covering some of these items are already in course of preparation, as is also a comprehensive book of instructions for the installation of appliances in private dwellings.

Propaganda and Uses of Gas.—A special prize of 5000 francs was awarded to A. Pignot in recognition of his important work on the use of compressed gas for motor vehicles.

An exhibition of gas appliances was held during the year and prizes were awarded in respect of a number of the exhibits: The Phi-Export water-heater (Société Française de Chaleur et Lumière), the R. Bosch safety valve (Etablissements Lavalette), Boa flexible tubing (Manufacture Métallurgiqué de la Jonchère), and an inclinable tube-manometer designed by M. Prévot. Worthy of honourable mention were a special union for flexible tubing invented by M. Ebrard, an automatic gas cut-out for hot water accumulators (Société des Etablissements Théobald), and a gas economizer (Société Auxiliaire du Gaz). The latter device turns on the gas and lights it from a pilot flame when a vessel is placed over the burner and extinguishes it when the vessel is removed.

GAS ANALYSIS.

A comprehensive paper on the use of the Bunte burette for the analysis of town gas was presented by R. Sabonadier.

The precautions to be taken to secure accurate results were indicated. In particular, a method for correcting for the solubility of the carbon dioxide formed in the final explosion was described. The relative efficacy of ammoniacal and acid solutions of cuprous chloride was discussed and information was given as to the effect of temperature and strength of the acid solution on the amount of carbon monoxide absorbable by unit volume of the reagent and of the carbon monoxide concentration in the gas in equilibrium with partially spent reagent.

Other points considered were the maximum safe temperature in the catalytic combustion of hydrogen over palladium for avoidance of partial combustion of the saturated hydrocarbons and the question of the evolution of carbon monoxide from alkaline pyrogallol.

Useful indications were given as to the relative volumes of residual gas (methane *plus* nitrogen) and oxygen to be taken to ensure that the explosion occurs without danger of shattering the explosion vessel.

PRECAUTIONS IN USE OF JUNKERS CALORIMETER.

G. Thomas investigated a systematic difference of 5 B.Th.U./c.ft. occurring between the calorific value of gas determined at the works and at the official testing station situated at the centre of the distribution system. This was traced to unsound connections in the apparatus at the latter location. The need for sound connections is, therefore, emphasized.

Tests with a bright new nickel calorimeter and a dull old calorimeter showed a possible effect of 5 B.Th.U./c.ft. on the calorific value in the case of the old calorimeter which gives the lower value. The calorimeter must, therefore, be kept polished.

It was also pointed out that the calorific value of town gas is actually 5 B.Th.U./c.ft. higher than the determined value if the atmospheric temperature is 60° F., and the air used in the combustion is but 50% saturated with water.

PHYSICAL CONTROL OF GAS QUALITY.

E. Wibratte presented a paper describing instruments which may be employed in the physical control of gas quality. The well-known Löffler explosion calorimeter enables the calorific value of very small samples of gas to be rapidly determined, and is a useful instrument for spot-tests. It has, for example, been employed by a large gas association for tuning up the carbonizing plant in its various small works. It proved of use, also, in the motor rallies, since it was possible to carry out rapid tests on the calorific value of the various gases supplied to the gas-driven vehicles.

A modified apparatus enables, in addition, the upper and lower explosion limits to be determined, and is of use in the study of the combustion characteristics of gases.

METHODICAL DEVELOPMENT OF A GAS UNDERTAKING.

L. Carpentier introduced his subject with the statement that development implies an increase in the sale of gas which may be realized either by an increase in the number of consumers or in their requirements or by an extension of the applications of gas. However, the plant and the distribution system must be of sufficient size to render such developments possible. A further question which arises is the necessity of improving the efficiency of the undertaking and of reducing the selling price of gas to the maximum extent.

The considerations which follow apply to small and medium-sized works.

Two possibilities may occur. Either the carbonizing plant must be extended or replaced by new plant or the output of the existing plant must be increased. The question of extension or replacement is one of economics and will be answered with due regard to which of the two enables gas to be produced the more cheaply. On the assumption that replacement of carbonizing plant is found to be desirable, the selection of the particular system of carbonization to be adopted necessitates consideration of capital costs, maintenance charges, the nature of the coke produced, flexibility, possibility or otherwise of shutting down portions of the plant during seasons of low demand, ability to handle different types of coal, &c. Consideration must also be given to the question of producer plant with the object of selecting a type capable of handling breeze and giving the minimum clinkering trouble. The advisability of extending the plant by provision of water-gas generators must also receive consideration, since this type of plant enables coke to be disposed of in times when coke-market conditions are unfavourable. If the price of gas oil continues to fall, carburetted water-gas plant will quickly tend to return to favour.

A possibility of reducing the selling price of gas involves close control of a number of factors. Coal must be purchased under the most favourable conditions, the plant must be maintained in perfect condition, and plant operation must be systematically controlled. The coal should be low in ash and sulphur, the carbonizing conditions suited to the coal, and, where a variety of coal is handled, blending plant should be available.

Shock cooling of the gas with efficient tar extraction is recommended, and naphthalene washing is advisable, since, thereby, blockage in the distribution system will be avoided. The purification plant should be of ample capacity, and the ammonia recovery process should be so arranged that a liquor of maximum strength is obtained.

The coke should be quenched under such conditions that it does not contain excessive amounts of moisture. The coke-handling plant should be such that no more breakage occurs than can be avoided. The holder capacity must

be adequate to maintain the necessary pressure at all times, and a reliable governor is essential.

A further matter for attention is the extension of the carrying capacity of the distribution system. It may be necessary to increase the pressure or to replace sections with mains of larger capacity or to install feeder mains. Generally, all three will be necessary. Various considerations affect the choice between steel and iron mains.

Outside work, including the reading of meters, must be organized systematically with a view to the utmost efficiency.

Tariffs must be so framed that the use of gas is encouraged, and must not be of such a nature that a consumer must purchase an inordinately large quantity of gas before obtaining the benefit of the most favourable rate.

Finally must be mentioned propaganda, the canvassing of consumers, both domestic and industrial, and a showroom where a variety of appliances may be seen at work.

FUSIBILITY OF COAL ASH.

L. Bro, who had published a preliminary paper on the subject last year (see "JOURNAL," Vol. 199, p. 500), presented an account of his more recent investigations on the fusibility of coal ash.

The furnace employed is oil-fired, the secondary air being preheated. The test-cone made from the coal ash under investigation is enclosed in a muffle inserted in the furnace. Control of the atmosphere is secured by introduction of air when the test is carried out under oxidizing conditions and of a mixture of town gas and steam when the test is carried out in a half-oxidizing, half-reducing atmosphere. Temperature measurements are made with a thermocouple and a disappearing filament pyrometer.

A special feature of the author's method is the fact that the test-piece is under constant observation during the fusion period through a telescope provided with a micrometer scale in the eye-piece. It is thus possible to take readings of the height of the test-piece at successive temperatures, and the readings are employed in the construction of squatting curves which give valuable information.

In the paper were included data covering the fusion points of the ashes of a number of Durham and Continental coals and indications of the clinkering propensities of the corresponding cokes when used in producers.

PRESSURE HOLDERS.

A paper dealing with cylindrical pressure holders was presented by B. Delaruelle, who had made a study of them in connection with a proposed installation of three holders of this type at Villeneuve-Saint-Georges.

The advantages of high-pressure holders over tank holders may be summarized as follows:

(1) The ground space required is less than for tank holders in the ratio of approximately 6:10 in the case of small holders, though the gain is not so great with larger holders. Most of the other advantages also disappear in large installations. As regards ground space, however, further economies may be realized by superimposing the holders one above another, or by placing them vertically.
(2) The installation costs are lower.
(3) The quantity of gas in storage is subdivided into units; hence inspection is easier and extensions can readily be made.
(4) The holders can be transported to another works.
(5) Maintenance costs are lower, since the surfaces requiring to be painted are smaller.
(6) No heating is necessary in winter, since there is no water seal.
(7) The appearance is less unsightly.

Their only disadvantage is the cost involved in the compression of the gas, and this depends on a variety of local conditions.

The function of holders may be regarded as: (1) To balance the fluctuations in demand; and (2) to provide a reserve for contingencies. It would appear that the former purpose might be served by tank holders, and the latter purpose, at least partially, by pressure holders. Thereby compression costs may be lowered.

There are special circumstances which swing the choice very definitely in favour of pressure holders—*e.g.*, where the ground is unsuitable for tank holders or where the holder forms part of a high-pressure distribution system. In the latter case, compression may be effected at night with use of current at low prices. Moreover, the use of high pressure enables an economy to be effected in the cost of feeder mains.

The installation described by the author comprises three pressure holders each 38 ft. 6 in. long and of 10 ft. external diameter. Their water capacity is 2825 c.ft. per holder. The shells are of Martin mild-steel, autogenously welded, and are $\frac{5}{8}$ in. thick. The holders are carried on three reinforced concrete supports, but are only fixed to the central one in order to allow for expansion in the direction of their length. The working pressure is 115 lbs./sq. in., absolute; hence each holder will store 22,600 c.ft. of gas, of which 19,775 c.ft. are released when the pressure is reduced to atmospheric.

The cost of the complete installation, including compressors, did not exceed 170,000 francs (£2000 at the present rate of exchange).

INVESTIGATION OF THE FLOW OF GAS IN LONG-DISTANCE MAINS.

J. Coudeville presented an account of the extensive investigation of pressure losses carried out in the supply area of the Société Lyonnaise des Eaux et de l'Eclairage. The mains in use have diameters of 8 in., 7 in., and 6 in., the total length being approximately 53 miles.

It was found that pressure loss may be represented by a formula of the Chicago type, provided that appropriate values are employed for the friction factor.

It was found that the friction factors for gas and air are the same at relative velocities of gas to air equal to 1·54:1.

The quantity of gas which passes through an iron tube of given diameter and length with a given pressure drop is approximately $2\frac{1}{2}\%$ less than passes through a corresponding steel tube.

The friction factor, though depending on the velocity of the gas, was found to be independent of the actual pressure of the gas.

THE PLANNING OF MAINS FOR MEDIUM AND HIGH PRESSURES.

F. Prégermain presented an account of the factors requiring to be taken into consideration in planning a distribution system for gas at medium or high pressure with special reference to a particular case in which the length of main was of the order of 30 miles, the maximum hourly throughput of gas approximately 100,000 c.ft., and the initial pressure approximately 70 lbs./sq. in.

HYDRAULIC VALVE FOR BRANCH MAINS.

A hydraulic valve was described by L. Joly. It consists of a casting in one piece, and, in essence, forms a cylinder closed at the top and bottom. Near the top, two side branches are fixed—one for inlet and one for outlet of gas. An internal partition extending from the top and reaching half-way down divides the cylindrical portion into two sections of unequal size. In the larger section is a tube passing through the top of the cylinder and closed with a screw cap at the top, the lower end, which reaches to the bottom of the cylinder, being cut off at an angle of 45°.

If sufficient water is introduced, *via* the tube, to reach above the lower end of the partition, flow of gas is prevented. Similarly, if water is withdrawn so that the end of the partition is no longer covered, flow of gas can take place.

A sufficient quantity of water is always allowed to remain at the bottom to seal the lower end of the tube; hence no gas can escape when the cap is removed to operate the valve. Where frost is feared, the valve may either be buried fairly deeply in the ground or glycerine may be added to the water.

A RATIONAL SERIES OF CONSUMERS' METERS.

M. Fourmanoir described the Σ_A meter designed by the Sigma Company and which may constitute the first member of a rational series of meters. It is envisaged that the series will comprise five meters with maximum consumptions, at a pressure drop of $\frac{1}{16}$ in. W.G., equal to 180, 360, 540, 900, and 1440 c.ft./hr. respectively. The smallest of these meters has now been constructed and measures approximately 10 in. in height, 9 in. in breadth, and $8\frac{1}{2}$ in. from back to front. It contains two bells having an oscillating movement.

An axle carries four rods 1, 2, 3, and 4 in sequence, rods 1 and 2 being situated at one end and rods 3 and 4 at the other end. To one end of rods 1 and 3 is attached one of the bells, the free ends of these rods being fitted with counter-weights. The second bell and corresponding counter-weights are attached to rods 2 and 4. The rods are suitably bent to enable each bell to oscillate up and down between the counter-weights of the other bell. The whole arrangement, therefore, occupies the minimum of space.

The meter is oil-filled and holds $\frac{3}{8}$ gallon of oil. All moving portions, apart from the slide-valves, are in an oil-bath.

LARGE GAS KITCHENS.

A. Grebel gave a comparison of the relative merits of gas, coal, and electricity for culinary purposes and pointed out that gas is especially suitable for use in the kitchens of institutions in which a large number of people are served with a fixed meal. The low consumption of gas per meal cooked under such conditions enables gas to be a successful competitor against other fuels, whereas in restaurants, hotels, or clubs the use of gas is only encouraged if great concessions are made in the selling price of gas.

Atmospheric burners, in view of their simplicity of operation, are preferable to high-pressure burners. The cookers should be well insulated to prevent waste of heat, and endeavour should be made to educate the kitchen staff with the same end in view. Particulars were given of the types of appliances suitable, and information was presented as to the consumption of gas in a few institutions.

The use of gas in a military hospital at Paris formed the subject of a paper by G. Reclus, who indicated that in the last three years 89 all-gas kitchens providing meals for 15,000 people have been installed in institutions in Paris.

The hospital with which the paper deals serves, on an average, nearly 600 people per day with a daily gas consumption of approximately 6300 c.ft. Particulars were given of the lay-out of the kitchen and of the appliances installed in it.

PAPERS ON TAR.

WATER AND LIGHT OILS IN TAR.

A modified Dean and Stark apparatus was described by P. Vincent. Benzole (30 c.c.) is introduced into the collecting vessel, which contains a central funnel through which the distilled water can sink, and becomes gradually displaced into the tar (500 c.c.) undergoing dehydration. The evolved water condenses and collects under the benzole remaining in the collecting vessel. The operation of dehydration thus occurs in presence of sufficient benzole to enable the water to be distilled off without danger of frothing.

The method may be used to determine, in addition, the light oil content of a tar. The result is, however, too high if the collecting vessel is completely filled with benzole prior to the test since some of the middle oils are carried over by the benzole. In this case, therefore, the collecting vessel is first filled to within 5 mm. of the overflow level with a known volume of water. The remainder of the volume quickly becomes filled with benzole from the tar, and this benzole then continuously flows back to the tar. Distillation is stopped when the temperature reaches 170° C. As necessary, surplus amounts of water are run from the collecting vessel into a graduated burette, otherwise the collecting vessel would become completely filled with water which would flow back to the tar and cause priming.

DEHYDRATION OF TAR OF HIGH LIQUOR CONTENT.

C. Ab-der-Halden described the continuous dehydration plant installed at the coke-oven plant of the Shotts Iron Company, Scotland, for the treatment of 30 tons per day of a tar containing 30% of liquor.

The tar, preheated by dehydration vapours, passes into a decanter from the bottom of which it proceeds, *via* a syphon, nearly to the bottom of the dehydrator which contains a large volume of dehydrated tar. The violent evaporation of the water creates the necessary agitation which may be supplemented, if necessary, by steam. Dehydrated tar is drawn off from the bottom of the tar by way of a tube in the dehydrator and fitted with an overflow branch issuing from the side of the dehydrator.

The rate of throughput of the tar is adjusted to the volume of tar in the dehydrator, depending on the liquor content of the tar.

TAR DEHYDRATION IN SMALL GAS-WORKS.

A tar dehydration plant suitable for small works, and intended for use in connection with the despatch of hot dehydrated tar in tank-wagons, was described by P. le Goupils. It is of the intermittent type.

The tar is charged to a tank of 6 tons capacity and is heated by the thermo-syphon principle by means of a tubular steam-heated heat interchanger through which it circulates. The tar returning to the tank enters a froth-breaking device before rejoining the main body of tar. Circulation is allowed to proceed until the tar is dehydrated. It is often the case that partial separation of liquor occurs during the treatment, in which event the liquor may be drawn off by decantation during the process. This results in less heat being required.

The process may be interrupted, if desired, and resumed later, though in this case the heat consumption is slightly increased. It is sometimes desirable to return to the tank the light oils which come over with the water.

TAR, A BYE-PRODUCT OF THE GAS INDUSTRY.

J. Bing presented an account of the development of the use of tar on roads and considered, also, the various outlets for tar. Except in a very few large works, complete distillation is impracticable, and, for small works, the preparation of road tar is indicated unless complete distillation under a co-operative scheme can be arranged.

Gas for Internal-Combustion Engines

By Dr. C. M. WALTER.

[From the "Iron and Coal Trades Review"]

Before the Summer Meeting of the Institution of Mining Engineers at Edinburgh, on July 12, Dr. C. M. Walter read a Paper on "The Application of Town Gas for the Running of High-Speed Internal-Combustion Engines," in the course of which he examined the characteristics of benzene and town gas, in so far as they concerned the internal-combustion engine. He said it had been proved that the power and thermal efficiency of internal-combustion engines varied with different fuels. In the case of liquid fuels, which were a mixture of hydrocarbons, a wide range in the chemical composition and, therefore, grade of fuel, could be obtained. The chemical composition of the fuel had a great influence on the performance of the engine, with the result that there were certain fundamental factors which limit the maximum power and thermal efficiency. These might be expressed as: (1) The heat of combustion per unit volume of charge; (2) composition of the products of combustion; (3) specific heats of the products of combustion and the amount of dissociation of the molecules CO_2 and H_2O; (4) change in the number of molecules after combustion; (5) volumetric efficiency; and (6) loss of heat by direct radiation.

Items 1 to 4 could be calculated for any of the fuels. As an example of a liquid fuel, the author took benzene, the chemical formula of which is C_6H_6. The combustion equation is:

$$2C_6H_6 + 15O_2 + 56{\cdot}4N_2 = 12CO_2 + 6H_2O + 56{\cdot}4N_2,$$

i.e., 7·5 volumes of O_2 are required for the complete combustion of one volume of benzene. This is associated with 35·7 volumes of air. The lower heat of combustion of benzene is 540 calories per grm. molecule, which is equivalent to 3770 B.Th.U. per c.ft. of vapour. The heat of combustion per c.ft. of benzene-air mixture is 105·4 B.Th.U. In the case of town gas of declared calorific value of 475 B.Th.U. per c.ft. and theoretical air to gas ratio 3·74, the heat of combustion is 95·4 B.Th.U. per c.ft. of mixture. There is thus a loss of 9·5% in the capacity of the cylinder of the engine for doing indicated work.

From an examination of the combustion equation for benzene (continued the author), it will be seen that the products of combustion per c.ft. of benzene consist of 6 vols. CO_2, 3 vols. H_2O, and 28·2 vols. N_2, the analysis on a wet basis being 16·13% CO_2, 8·07% H_2O, and 75·8% N_2. The analysis of the products of combustion (W.B.) of 1 c.ft. of town gas mentioned above is 9·98% CO_2, 4·32% H_2O and 68·70% N_2. These facts submitted in item (3) give a most important clue to the explanation of the difference

in the behaviour of liquid and gaseous fuels in the internal-combustion engine.

Results of Practical Tests.

During the preliminary experimental work carried out by the City of Birmingham Gas Department, engines designed for running on petrol were employed without any modifications being made, and in the case of a 20-h.p. engine having a compression ratio of 4·6, it was found that, when running under ordinary conditions on town gas, the maximum power output obtainable amounted to only 75% of that obtainable with petrol. By the employment of a special design of air-gas mixer, it was found possible to increase this figure to 88%, and by modifying the induction system of the engine this figure was again increased to 92·8% without any alteration to the compression ratio. The compression ratio was then increased to 5·6, with the result that a maximum power output at least equal to that obtainable from petrol was developed. It is of particular interest to note that, when running under these conditions, there were no signs of detonation occurring, even when running with an ignition-advance angle of 40°; further, an analysis of the exhaust gases showed the complete absence of carbon monoxide under all running conditions.

This engine was afterwards fitted to a chassis and has been used on ordinary service work since 1932, during which period a distance of over 7000 miles has been covered. Throughout the whole of this run, the engine has not received any special attention, and only on two occasions have the sparking plugs been removed to ascertain whether any carbon deposits had been formed in the head, such as might necessitate decarbonization. In both instances examination showed that only a slight carbon deposit was present, and it is anticipated that it will not be necessary to take down the engine for cleaning for some considerable time, although it is itended to make a complete examination of the whole engine after 10,000 miles have been covered.

Steel Bottles for Storage Purposes.

During the period of experimental work on engines, further experimental work was being conducted in connection with the design of multi-stage compressors, storage cylinders required to store gas at the filling station for charging vehicle cylinders, and light-weight cylinders suitable for mounting on vehicles for storing gas at working pressures up to 3000 lbs. per sq. in. A considerable amount of information has already been published in regard to the various qualities of steels employed for the production of storage cylinders of this type, but it might be of interest to point out that at the present time most of the cylinders used on actual vehicles are composed of alloy steels containing nickel, chromium, and molybdenum.

The dimensions of these cylinders approximate to 8 in. outside dia. and 73 in. long, with a wall thickness of 0·22 in. The internal volume is 1·76 c.ft., and thus at a working pressure of 200 atmospheres the volume of free gas contained is about 352 c.ft., and the approximate weight of each bottle empty is 119 lbs. The number of bottles carried depends on the size and type of vehicle. Alloy-steel bottles of this type are being manufactured by Messrs. Vickers-Armstrongs, Ltd., Newcastle-upon-Tyne, and the Chesterfield Tube Company. In the case of a test specimen from a bottle made by the former firm, the following results were obtained: Ultimate, 67·9 tons per sq. in.; yield, 59·5 tons per sq. in.; Izod, 53·0 ft.-lbs.; elongation, 22·8%; reduction of area, 59%. In the bending test, the specimen bent through an angle of 180° without fracture. The limit of proportionality—*i.e.*, maximum stress at which strain is proportional to load, is 47 tons per sq. in.

In the case of vehicle bottles with a working pressure of 3000 lbs. per sq. in., the wall thickness is such that the maximum working stress is 25 tons per sq. in., whilst in the case of the stationary storage cylinders where a working pressure of 5000 lbs. per sq. in. is employed, it is proposed that a working stress of not more than 16·7 tons per sq. in. should be employed, this giving a factor of safety of three in the case of cylinders heat-treated to give an ultimate strength of 50 tons per sq. in.

The complete equipment necessary to operate a vehicle on town gas includes: A battery of storage cylinders of the type already described; a suitable reducing valve to reduce the pressure from the working pressure in the storage cylinders to any desired pressure at the engine inlet, and also an air-gas mixer which takes the place of the ordinary carburettor.

The author then referred to the gas-compressing plant, pointing out that the experimental compressor which they have installed was manufactured by Messrs. Belliss & Morcom, and was a four-stage machine. It was designed to compress and deliver 10 c.ft. of gas per minute at 5000 lbs. per sq. in. The gas passed through inter-coolers after each stage, which ensures a high isothermal efficiency. At the present time, a further six-stage machine is being installed at one of the works of the Birmingham Gas Department, with a view to increasing the facilities for supplying gas for vehicles at pressures of 3000 lbs. per sq. in. This machine would be capable of delivering 100 c.ft. of free gas per minute into storage cylinders at a pressure of 5000 lbs. pr sq. in., from which vehicles will be filled to a working pressure of 3000 lbs. per sq. in.

Economic Consideration.

From a careful analysis of the costs in the case of a station capable of compressing and delivering 350 c.ft. of free gas per minute at 5000 lbs. per sq. in., it is found that the compressing charges amount to approximately 1s. per 1000 c.ft. Where gas of calorific value of approximately 500 B.Th.U. per c.ft. can be supplied at 4d. per therm at the inlet to the compressor, the total cost of gas into the vehicle would amount to 2s. 7d. per 1000 c.ft.

It has been found by experiment that 265 c.ft. of gas of 475 B.Th.U. per c.ft. is equivalent to 1 gallon of petrol; hence the equivalent cost of petrol to give the same performance as gas at the price mentioned would be 8·23d. per gallon. This does not include, however, the capital and depreciation charges connected with the vehicle equipment.

It may be of interest to mention at this point that, with regard to the two vehicles which have been running in Birmingham on town gas, the cost of conversion in the case of the 20-h.p. van amounted to about £100, while the approximate cost of converting a 32-seater passenger-carrying vehicle was £130, the difference being largely due to the fact that five storage cylinders were employed on the van, whereas in the case of the passenger-carrying vehicle, seven similar cylinders were found to be necessary.

Conclusions.

From the results of the experimental work, there seems little doubt that town gas can be employed with distinct advantage as a substitute for petrol, particularly in the case of the heavier types of vehicles, the advantages to be obtained resulting in reduced running costs where gas can be obtained at approximately 4d. per therm, and also in considerably-increased flexibility, which has been so pronounced in the case of all engines so far experimented with.

Further, it is found that engines, after being suitably modified to run on town gas, will run at idling speeds considerably below those which are obtainable with petrol, and the completeness with which combustion takes place over a very wide range of power output is indicated by the fact that over the range of full load to idling, no carbon monoxide is found to be present in the exhaust. It will be appreciated from what has been said that, so far, the experimental work which has been carried out has been connected with engines primarily designed to run on petrol with certain modifications such as increase of compression ratio, to enable reasonable thermal efficiencies to be realized; but there seems little doubt that it would be possible from the experience now obtained to design engines for running on town gas, which would show very considerable increases of efficiency over those obtained up to the present.

Discussion.

The President (Mr. J. Brass) said there was one phase of this question which perhaps did not come within the ambit of the paper, but he could see a bigger future for gas than merely the application of compressed gas to motor vehicles. There were hundreds of hamlets, farmhouses, &c., where there was no possibility of getting power to them, but he thought the day would come when they would be able to sell bottles of gas to householders. If people could get supplies in that form economically it would be a most attractive proposition. The idea would be to sell supplies capable of covering a period of two or three months. He believed there were possibilities in this project so far as traction companies were concerned. His (the President's) Traction Committee, which operated at home on twelve miles of roads, would save something like £35,000 a year if they adopted coke oven gas in preference to petrol. That was undoubtedly a considerable saving. He believed there was one colliery company which kept a 'bus, and in that connection Major Currer Briggs might be in a position to say how his firm was progressing with its omnibus which was driven by compressed gas.

Major Currer Briggs said the subject dealt with by the author was of considerable interest. The 'bus referred to by the President was largely used for commercial purposes by his firm, and the idea owed its inception to a desire to ascertain at what price they could supply compressed gas. So far as he could remember, the 'bus was of the old Westinghouse type of 28 to 30 h.p. If the large transport companies could be persuaded to provide sufficient capital to equip services running over short routes the benefit would be considerable to all concerned. His own view was that in the first instance producers

of coke oven gas would have to finance one or two of these enterprises so as to give an incentive to the transport companies to take the responsibility upon themselves eventually. He should like to know if the author had considered whether it would be possible to transport a large storage of compressed gas to some predetermined place on a route so that 'buses could fill up when required. A supply only capable of accomplishing a run of 60 or 70 miles was not sufficient. It was that difficulty with regard to storage and supplies which was preventing the transport companies from seriously considering this business and developing something which would really be of the greatest benefit to the whole coking industry as well as establishing a national asset.

Mr. J. IVON GRAHAM said it seemed to him that they should consider increasing the calorific value of the gas supplied. It was there he felt that one of the most important developments in regard to the application of gas could be made.

Dr. WALTER rapidly reviewed the points raised in the discussion. He appreciated the way in which his paper had been received.

Coal-Gas Vehicles and the 1933 Finance Act

The attention of our readers has already been drawn to the amended rates of motor vehicle duties which are imposed, as from Jan. 1 next, by Section 25 of the Finance Act, 1933. It is thought, however, that they may wish to have in easily accessible form a comparison of the various rates which will be operative in the case of differently propelled vehicles.

Our reason for the early publication of the following tables is that potential users of coal-gas driven vehicles will look to gas officials to guide them as to the comparative licence costs, for this item will no doubt have the effect of leading transport operators to investigate the claims of coal gas as a means of propulsion.

At the present moment, the duties are levied irrespective of the fuel used, and from the differentiation against vehicles using heavy oils it will be noted that the scales are to be based on the "unladen weight."

The proviso to Section 25 of the Act exempts vehicles used by a local authority for cleansing or watering roads from the operation of these provisions, while separate parts (not here reproduced) of the Seventh Schedule relate solely to the duties applicable to vehicles used in agriculture and by travelling showmen respectively.

Provisions of the Seventh Schedule to Finance Act, 1933. Relating to the Taxation of Coal Gas-Propelled Vehicles.

PART I.

	A.		B.	
	X.	Y.	X.	Y.
	£ s. d.	£ s. d.	£	£ s. d.
Vehicles having a seating capacity for:				
Not more than 4 persons	10 0 0	10 0 0	10	10 0 0
More than 4 but not more than 8 persons	12 0 0	12 0 0	12	12 0 0
" 8 " " 14 "	24 0 0	30 0 0	32	40 0 0
" 14 " " 20 "	36 0 0	45 0 0	48	60 0 0
" 20 " " 26 "	48 0 0	60 0 0	68	85 0 0
" 26 " " 32 "	57 12 0	72 0 0	88	110 0 0
" 32 " " 40 "	67 4 0	84 0 0	108	135 0 0
" 40 " " 48 "	76 16 0	96 0 0	128	160 0 0
" 48 " " 56 "	86 8 0	108 0 0	148	185 0 0
" 56 " " 64 "	96 0 0	120 0 0	164	205 0 0
More than 64 persons:				
For the first 64 persons	96 0 0	120 0 0	164	205 0 0
For each additional person in excess of 64	1 4 0	1 10 0	2	2 10 0

Interpretation of above Table Headings.

A = Vehicles propelled by steam, electricity, or those which are not constructed or adapted to use as fuel any fuel other than light oils.
B = Hackney carriages not chargeable with duty under "A" (*i.e.*, using heavy oils).
X = Vehicles fitted with pneumatic tyres.
Y = Other vehicles (solid tyres).

NOTE.—The duties on petrol-driven hackney vehicles are unaffected.

PART III.

	A.		B		C.	
	*	†	*	†	*	†
	£	£ s. d.	£	£ s. d.	£	£ s d.
Not exceeding 2 tons in weight unladen	25	25 0 0	25	25 0 0‡	..	..
Exceeding 2 tons, but not exceeding 2½ tons in weight unladen	30	40 0 0	30	40 0 0	35	46 13 4
" 2½ " " " 3 " " "	35	46 13 4	35	46 13 4	45	60 0 0
" 3 " " " 4 " " "	50	66 13 4	50	66 13 4	65	86 13 4
" 4 " " " 5 " " "	70	93 6 8	70	93 6 8	90	120 0 0
" 5 " " " 6 " " "	90	120 0 0	90	120 0 0	120	160 0 0
" 6 " " " 7 " " "	105	140 0 0	110	116 13 4	150	200 0 0
For each additional ton, or part of a ton, in excess of 7 tons	15	20 0 0	20	26 13 4	25	33 6 8

Interpretation of above Table Headings.

A = Vehicles which are propelled by steam, or which are constructed or adapted to use coal gas as fuel.
B = Vehicles which are not constructed or adapted to use as fuel any fuel other than light oils.
C = Vehicles which are not chargeable under "A" or "B" (*i.e.*, using as fuel heavy oils).
* = Vehicles fitted entirely with pneumatic tyres.
† = Other vehicles (solid tyres).
‡ = Other duties are in force below 2 tons.

NOTES ON PLANT AND PROCESSES

Pegson Rammer Fitted with Magneto.

The Pegson rammer, which has been operating successfully for some months, was originally equipped with trembler coil and battery ignition. An experimental machine has been equipped with a magneto and was demonstrated to a number of surveyors at the works of Pegson, Ltd., on July 6.

The advantages of a self-contained machine are obvious, and there is no doubt that this new model will create considerable interest when placed upon the market.

Automatic Coal Metering.

Two interesting brochures have recently been published by the Lea Recorder Company, Ltd., of Cornbrook Park Road, Manchester, on the subject of automatic metering of coal, in the one case, for Lancashire boilers fitted with mechanical stokers, and, secondly, in pipes and chutes for boilers, pulverizers, &c.

In view of the enormous amount of coal which an ordinary Lancashire boiler can consume in a single year—viz., anything from 1000 to 3000 tons—and in view of the possibility of a large portion of it being wasted, it is hardly necessary to emphasize the importance or desirability of having a continuous check upon the amount consumed every day, or even every hour.

For a considerable number of years the firm have manufactured meters for attachment to chain grate stokers, and some thousands of these are now in successful use in all parts of the world in connection with water tube boilers. In more recent years they have applied the same fundamental principle of volumetric measurement to Lancashire boilers, where fitted with mechanical stokers of the ram or plunger type. The brochure goes on to explain theoretically and diagrammatically the principles of operation of the meter, with photographs of typical installations.

As the cross sectional area of the rams is constant, all that is necessary is to provide means for obtaining the product of the length of the stroke and the number of strokes in a certain time. This is what the Lea patent coal meter does, and it does it automatically, however much the speed of the stroke may vary. A diagrammatic illustration clearly shows a typical arrangement for a Lancashire boiler, each ram being provided with a rack, gearing into a pinion, on the end of the shaft; but by means of the free-wheel, or non-return gear, only the forward movements of the rams are used for operating the meter. As the rams go to and fro, therefore, they rotate the shafts in proprtion to their strokes, whether these be long or short.

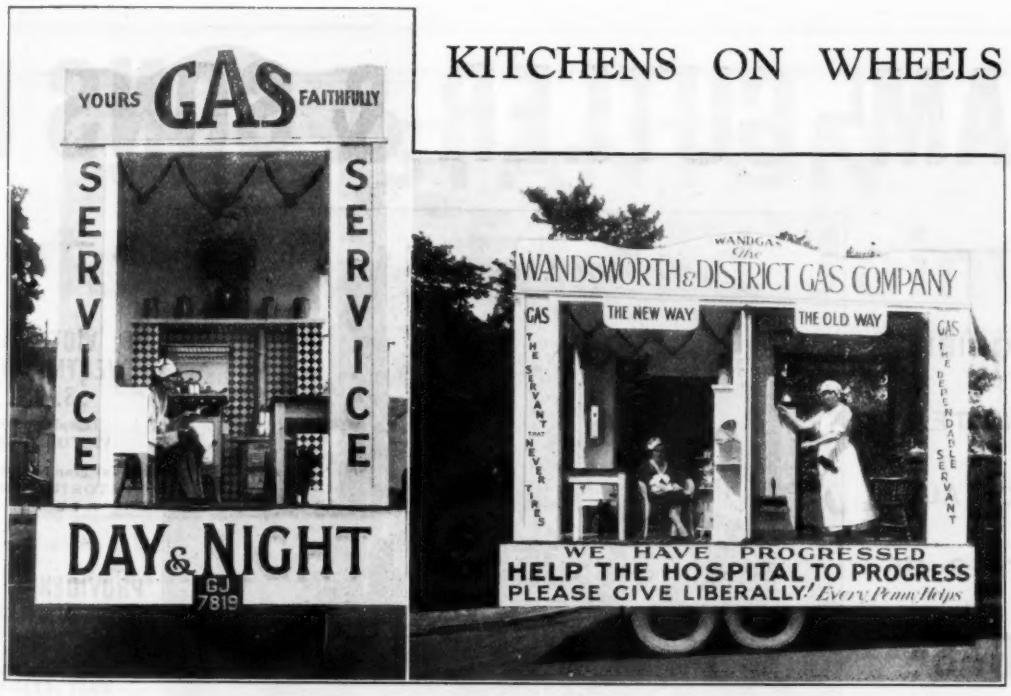
The "Chain" Principle of Measurement.

The principle of operation upon which the "Romer-Lea" patent coal meter works, dealt with in the other brochure, is so simple that it hardly requires explanation. Briefly, a chain immersed in the coal travels with it, at the same speed, down the chute. Assuming that the cross-sectional area of the chute is 1 sq.ft., and that the coal (and also the chain) moves 10 ft. downwards, then 10 c.ft. of coal will have passed down the chute. If, therefore, the chain is arranged to rotate a sprocket wheel, attached to the counter of a meter, the readings or revolutions of this counter will be proportional to the volume of coal passed.

In this connection it may be asked, What about the slip of the chain in the coal? Will the chain move at the same speed as the coal? Does the coal grip the chain? This is, of course, the most important question, for if the coal does not grip the chain, this meter is useless. The Lea Recorder Company, however, affirm that, under ordinary working conditions and with a chain immersion of anything exceeding 6 ft., there is no slip at all, and the chain moves along with the coal. It is, of course, obvious that with a very short length of chute—say, 3 to 4 ft.—there would not be sufficient grip between the coal and the chain to drive the meter positively.

This brochure also gives examples of typical installations of the meters.

KITCHENS ON WHEELS



A very ingenious display was arranged by the Wandsworth and District Gas Company on the occasion of the Sutton and Cheam Hospital Carnival recently held, the Company being awarded First Prize (Silver Cup) in the Class for Decorated Trade Vehicles. As the photographs illustrate, two kitchens were built on a six-wheeled lorry showing the old and new methods, the new kitchen being fitted with all the latest gas appliances, and the old kitchen with appliances in use approximately fifty years ago. The whole lay-out was designed by the local District Superintendent, Mr. J. Davis, and the staff at the Sutton Works, the principal slogans being "The New Way" and "The Old Way." To complete the display the human element was introduced—Mrs. K. Joy, Assistant at the Company's Su ton Showrooms, taking the part of cook in the old kitchen, and Mrs. J. F. Fleming, daughter of the District Superintendent, the maid in the new kitchen. At the presentation of prizes, which was carried out by the M.P. for the Division, Commander A. J. Southby, the Chairman of the Carnival Committee expressed his delight and pleasure at the turn out, saying he was surprised at the amount of detail which had been put into the two kitchens.

Successful Year at Northampton.

The Seventy-Sixth Ordinary General Meeting of the Northampton Gas Light Company was held on Thursday, Aug. 3, 1933. Mr. F. BOSTOCK, the Chairman, presided over the meeting.

The CHAIRMAN, in moving the adoption of the report and balance-sheet, said that the year had been a successful one in spite of the mild winter and exceptionally hot summer. The profit for the year was £38,876.

An interim dividend at the rate of 5% per annum was paid in February, and it was resolved to pay a final dividend at the same rate, making a total of 5% for the year (the maximum rate allowed). During the year mains had been extended to three villages, thus adding 377 new consumers, and a further 538 new consumers had been added in the town.

The Chairman announced that a staff pension scheme was to be started shortly.

Increased Sales at Glasgow.

The Glasgow Corporation Gas Committee, in submitting to the Corporation their sixty-fourth annual report and balance-sheet of the Gas Undertaking, which embraces the year from June 1, 1932, till May 31, 1933, state that the gross revenue amounts to £1,557,978 and the gross expenditure to £1,236,804, to which is added depreciation written off capital assets, £29,378, the balance carried to profit and loss account being a credit of £291,795. The quantity of coal carbonized during the past year was 548,299 tons, as compared with 550,450 tons for the preceding year, a decrease of 2151 tons. The average cost of coal carbonized last year was 16s. 4·301d., being 1s. 0·123d. less than the preceding year. The quantity of coal gas made per ton of coal carbonized was 15,474 c.ft., which, with water gas, gave an average of 15,900 c.ft., as compared with 14,967 c.ft. and 15,472 c.ft. respectively per ton for the previous year. The quantity of gas delivered and accounted for during the year amounted to 8,661,163,042 c.ft., as compared with 8,517,019,965 c.ft. for the preceding year, an increase of 144,143,077 c.ft., equal to 1·692%. The unaccounted-for gas during the year was 7·39%, as compared with 7·5% for the preceding year. The greatest quantity of gas sent out during the year in 24 hours was 37,158,000 c.ft., and the maximum daily make was 37,705,000 c.ft.

The net sum realized from the sale of coke this year amounts to £112,037, being £18,694 less than that of the preceding year. The total quantity of coke sold this year was 203,124 tons, compared with 206,714 tons for the previous year, a decrease of 3590 tons. The average price received was 13s. 3·569d. per ton, as compared with 14s. 0·311d. for the previous year, a decrease of 8·742d. per ton.

The number of ordinary meters in use on May 31 last was 191,958, as compared with 193,839 for the preceding year, a decrease of 1881. The number of prepayment meters in use on May 31 last was 132,656, as compared with 127,772 for the preceding year, an increase of 4884, giving a net increase of 3003 meters. During the year 22,962 meters were repaired at workshops. At May 31 last there were on loan 179,583 cookers and range fittings, 16,417 grills, 51,614 boiling burners, 35,610 gas fires on hire, 5566 radiators on hire, 1413 water heating appliances on hire—a total of 290,203, as compared with 297,690 for the preceding year.

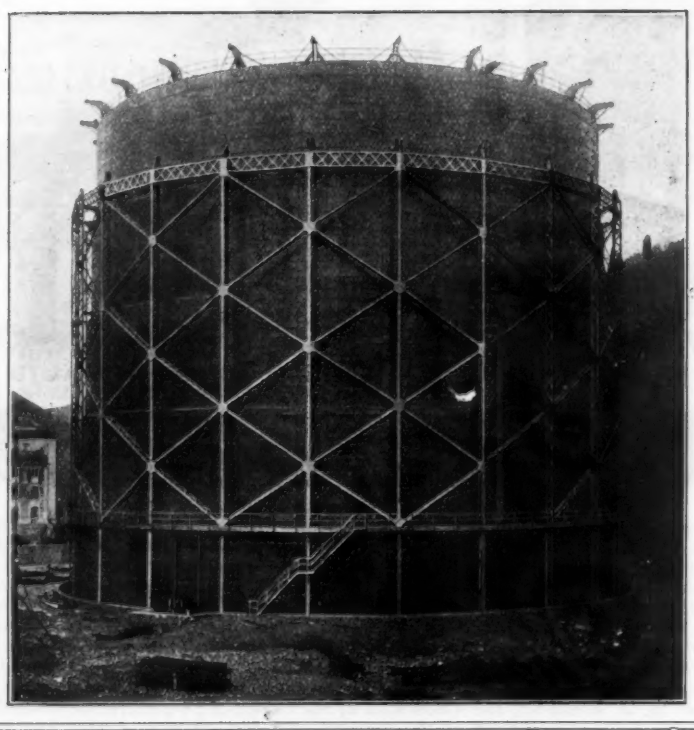
Corporation Undertakings' Results.

Chelmsford.

The balance-sheet shows that the year's trading resulted in a net profit of £2460. During the year the price of gas has remained at 4s. per 1000 c.ft. (10·66d. per therm) for ordinary meters, less 2½% discount, the charge for slot consumers, including cooker and meter hire being 4s. 8d. per 1000 c.ft. From Dec. 1, 1932, the Council extended the scale of reductions applying to large consumers from a minimum of 3s. 9d. per 1000 c.ft. to one of 3s. 3d. per 1000 c.ft., for an annual consumption of 9 million c.ft. and over, less the customary 2½% discount. The total sales to ordinary and prepayment consumers amounted to 205,715,200 c.ft., an increase of 5,701,200 c.ft. on the previous year, or 2·83%. The greater part of the increase is due to ordinary meters, but there is a welcome increase from prepayment meters resulting from the number of new consumers gained under the deferred payments installation scheme. The number of consumers added during the year was 335. The net receipts from bye-products, after deducting cost of handling, amount to £11,623, compared with £11,388 last year. The return from coke shows little variation (£9931 against £9945), but tar has provided additional revenue owing to the increased sale of prepared

SAML. CUTLER & SONS LTD

ENQUIRIES INVITED FOR ALL TYPES OF GAS-HOLDERS



39, VICTORIA ST., WESTMINSTER, S.W. 1
Telephone No.: VICTORIA 8492
Telegraphic Address: RETORTUS, SOWEST, LONDON

PROVIDENCE IRON-WORKS, MILLWALL, E. 14
Telephone Nos.: EAST 1734-1735
Telegraphic Address: CUTLER, MILLWALL, LONDON

tar for road purposes, the bulk of which was sold to the County Council under contract.

Darwen.

The gas sold was 166,919,800 c.ft. this being 6,817,300 c.ft., or 4·08%, more than the previous year. This increase is very satisfactory, especially considering the depression in industry in the district, and is solely due to the progressive policy adopted, as a consequence of which there has been a greatly increased use of appliances. During the year 514 yards of mains were laid, making a total mileage in the area of supply of 51 miles 500 yards. The revenue expenditure and income during the year was £33,682 and £41,758 respectively, leaving a gross profit of £8075, as compared with a gross profit of £5173 last year. After deducting interest on loans and sinking fund charges of £3972 and income-tax £541, there remains a net profit of £3561, as compared with a loss of £609 last year, an increased profit of £4170. The charges for gas were reduced during the year, and a new sliding scale adopted for domestic and industrial consumers. This has resulted in an average reduction of 4·33d. per 1000 c.ft. at a total cost to the Department of £2980. The balance owing on revenue account owing to accumulated losses at March 31, 1932, was £5731. The profit of £3561 this year reduces the deficiency on revenue account to £2169. The net indebtedness of the Undertaking is £17,038, being equal to £102 per million c.ft. of gas sold.

Dunfermline.

The total income amounted to £75,207 and the expenditure to £55,528, leaving a gross profit of £19,678. To this sum is added unemployment relief grants of £807, making a total credit of £20,486. From this sum there falls to be deducted: Repayment of loans, interest, income-tax, and expenses of loans fund, amounting in all to £21,758, leaving a debit for the year of £1272. This sum, added to the debit balance of £138 brought in last year, makes a total debit of £1410 to be carried forward. The quantity of coals carbonized during the year amounted to 22,003 tons, and the average price was 16s. 8·9d. per ton delivered into works. The quantity of gas made as per station meter amounted to 387,753,000 c.ft.—an increase of 17,628,000 c.ft., equal to 4·76%. This is the largest output in the history of the department, the sales exceeding the previous record by fully 16 million c.ft. The average yield of gas per ton of coal was 17,623 c.ft. as per station meter, or 17,869 c.ft. corrected. The net income from residual products amounted to £11,131, equal to 10s. 1·41d. per ton of coal carbonized, or 60·43% of the cost, making the net cost of coal 6s. 7·49d. per ton.

Lancaster.

The total receipts for the year amount to £88,192 and the total expenditure to £65,441, leaving a gross profit of £22,751 and a net profit of £11,562, which has been placed to the credit of the net revenue appropriation account. The credit balance brought in from the previous year was £23,100, to which the net profit on this year's trading of £11,562 falls to be added, making a total credit of £34,662. The coal carbonized during the year amounted to 25,106 tons, costing £25,622, an average of 20s. 4·94d. per ton. The gas manufactured, corrected to 60° F. and 30 in. barometer, was 437,461,000 c.ft—an increase of 23,446,000 c.ft., or 5·66%. The average yield of gas per ton of coal carbonized was 17,424 c.ft. of a declared value of 475 B.Th.U. per c.ft., equal to 82·76 therms per ton of coal. The gas sold, including public lamps, was 410,973,000 c.ft., and the gas used by the Department 7,858,000 c.ft., making a total of 418,831,000 c.ft. accounted for. The gas unaccounted for was 18,630,000 c.ft., equal to 4·25% of the gas made.

Warrington.

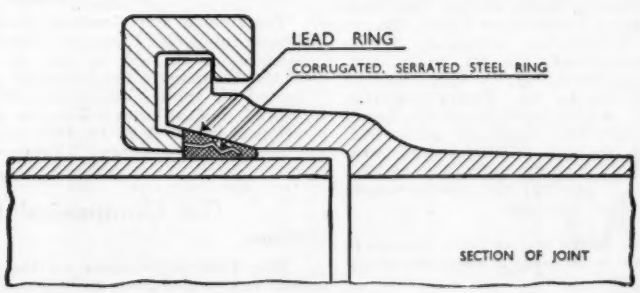
Mr. A. Cook, Engineer and Manager of the Warrington Corporation Gas Department, in his annual report mentions a net profit of £6258, which is an increase of £5181 on the previous year. The report points out that there was an increase in the production of gas of more than 2% during the year, and the increased profit was mainly accounted for by temporary improved tar markets (£1683), lower income-tax (£2784), and less grant renewals (£1261). The manufacturing costs were lower by 1·25d. per 1000 c.ft. The distribution costs are more by about three-tenths of a penny per 1000 c.ft. due to renewals and enlargement of mains and services, also the replacement and alterations of meters to high capacity necessitated by the heavier demand over shorter periods. The gas consumed was 663,410,000 c.ft., as against 657,576,800 c.ft. in 1931-32—an increase of 5,833,200 c.ft. The consumers number 6862 (6831) by ordinary meters, and 18,432 (17,617) by slot meters.

West Bromwich.

The accounts of the West Bromwich Corporation Gas Undertaking for the past year show a total income of £107,145, as compared with £110,236 the previous year, a decrease of £3091. The gross profit amounted to £17,240, and after payment of interest and sinking fund charges, special expenditure, and provision of income-tax, amounting altogether to £9226, there was a net profit of £8014, compared with £6390 the previous year. The net revenue appropriation account shows a balance in hand of £10,865.

The STANTON Mechanical Lead Joint

(Patent applied for)



NO INCREASED COST

This mechanically made joint works on a similar principle to the Stanton-Wilson Joint, but employs a lead ring in which is encased a thin corrugated, serrated steel ring. It is more flexible than a caulked joint and provides for expansion and contraction of mains—No skilled labour needed.

N.B.—Where a considerable degree of flexibility is required, use the Stanton-Wilson self-adjusting Joint, which has been adopted by over 200 Public Undertakings in this country.

The Stanton Ironworks Company Limited, Near Nottingham

GAS MARKETS & MANUFACTURES

Stock Market Report.

[For Stock and Share List, see later page.]

Despite the commencement of the holiday period and the fact that the Stock Exchange is passing through a 21-day account, business was surprisingly brisk last week. Gilt-edged and other high-class investment securities, particularly the prior charge stocks of home railways, continued to be in demand, and in the more speculative sections the higher prices ruling for the commodities led to increased quotations of tea and rubber shares. The feature of the week was the overwhelming success of the £15,000,000 Canadian Government 4% loan, the lists for which closed one minute after opening.

Gas stocks and shares maintained a firm tone throughout the week, and several quotations were marked up. Inquiries for North Middlesex 6% led to a rise of 9½ points to 149½, and at this price the yield on a 7½% dividend basis is still over 5%. At the local Exchanges, Sheffield consolidated gained 2½ points to 128½, but Newcastle units eased 3d. to 24s. 9d. and the 4% preference a fraction to 98½. Primitiva 4% debenture (1911) advanced a further 3 points to 88½, business being done at 90, and Brighton 5% consolidated, European, Gas Light 4% preference, and Wandsworth consolidated each rose 1 point. Cardiff ordinary was quoted *ex* div. a fortnight ago, and at its present price of 119½ appears attractive. The Company has distributed 6% on this stock for some years past, and at this rate the yield at the current price works out at £5 0s. 5d.%.

Current Sales of Gas Products.

The London Market for Tar Products.

LONDON, *Aug.* 4.

The market for tar products continues steady; current prices are as under:

Pitch, 80s. per ton f.o.b.
Creosote, 3d. per gallon.
Refined tar, 4d. to 4¼d. per gallon in bulk at makers' works.

Pure toluole is firm at about 2s. 6d.; pure benzole, 1s. 9d.; solvent naphtha, 95/160, 1s. 7d.; and 90/140 pyridine bases, about 4s. 3d., all per gallon naked at makers' works.

Tar Products in the Provinces.

Aug. 5.

The average prices of gas-works products during the week were: Gas-works tar, 31s. to 36s. Pitch—East Coast, 75s. to 77s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 75s. to 77s. 6d.* Toluole, naked, North, 1s. 9d. to 1s. 10d. Coal-tar crude naphtha, in bulk, North, 6d. to 6¼d. Solvent naphtha, naked, North, 1s. 5½d. to 1s. 6d. Heavy naphtha, North, 10d. to 11d. Creosote, *ex* works, in bulk, North, liquid and salty, 2d. to 2½d.; low gravity, 2d.; Scotland, 2d. to 2½d. Heavy oils, in bulk, North, 4d. to 4½d. Carbolic acid, 60's, 2s. 7½d. to 2s. 9d. Naphthalene, £9 to £10. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2¼d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *Aug.* 5.

The market is comparatively quiet at present, but values of most products are well maintained.

Crude gas-works tar.—Actual value remains at 42s. 6d. to 47s. 6d. per ton *ex* works.

Pitch.—The export price is nominal at about 75s. per ton f.o.b. Glasgow. Home demand is quite regular at 75s. per ton f.o.r. in bulk.

Refined tar to Ministry of Transport Specification is now valued at 3⅜d. per gallon f.o.r. in buyers' packages.

Creosote oil.—While new business is not too plentiful prices continue steady. B.E.S.A. Specification is 2⅜d. to 2⅞d. per gallon; low gravity, 2⅜d. to 2⅝d. per gallon; and neutral oil, 2⅜d. to 2⅞d. per gallon; all in bulk *ex* works.

Cresylic acid.—Values have increased fractionally owing to the fact that stocks are not now so heavy. Pale, 97/99%, is 10½d. to 11½d. per gallon; dark, 97/99%, 9d. to 10d. per gallon; and pale, 99/100%, 1s. 2d. to 1s. 3d. per gallon; all f.o.r. in buyers' packages.

Crude naphtha is nominal at 4d. to 4½d. per gallon *ex* works in bulk.

Solvent naphtha remains difficult to secure, and the value of 90/160 grade is not lower than 1s. 4d. per gallon. 90/190 heavy naphtha is, however, comparatively quiet at 1s. per gallon.

Motor benzole is only available in small quantities at 1s. 5d. per gallon f.o.r.

Pyridines.—90/160 grade is 3s. to 3s. 3d. per gallon, and 90/140 grade 3s. 3d. to 3s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s.	d.		s.	d.	
Crude benzole	0	9	to	0	9½	per gallon at works
Motor ,,	1	4	,,	1	4½	,, ,, ,,
Pure ,,	1	7½	,,	1	8	,, ,, ,,

Trade Notes.

Compressors for South Yorkshire Grid.

The first compressors to be installed for supplying coke oven gas to the South Yorkshire Grid were supplied by Messrs. George Waller & Son, Ltd., of Phœnix Iron Works, Stroud, to the Sheffield Coal Company for their Beighton coke ovens. They were put into commission last Christmas, and have been delivering continuously since that date 3 million c.ft. per day of gas. The machines are in duplicate, of the vertical enclosed steam tandem type, with compound cylinders, taking steam at 200 lbs. per sq. in. superheated to 600° F., and working against a discharge gas pressure of 20 lbs. per sq. in. at 240 r.p.m. They are equipped with special sensitive control governors and automatic shut-off valves. Similar machines have been supplied for delivering coke oven gas to Burnley and also to Nottingham.

Contracts Advertised To-Day.

Marple Urban District Council. [p. 311.]

New Capital Issues.

Pontardulais Gas Company (1930), Ltd.—The Directors of the Pontardulais Gas Company (1930), Ltd., are prepared to receive tenders for the sale of 2500 shares of £1 each in the capital of the Company. Conditions of and form of tender may be obtained on application at the Offices of the Company, the Gas-Works, Pontardulais. Tenders must be sent in (in sealed envelopes) before Aug. 12, 1933, addressed to the Secretary of the Company and endorsed "Tender for Shares."

Gas Companies' Results in 1932.

Malton.

The Directors' report on the Malton Gas Company for the half-year ended June 30 last shows that in the revenue account the expenditure has amounted to £7157, and the receipts to £9052. The balance of profit is £1895, against £2663 in the corresponding period last year. The chief reason for the reduced profit is the reduction made in the price of gas last October. There has also been a decrease in the consumption of gas used during the half-year owing to the generally depressed trading conditions and the loss of the contract for pumping the town's water. The receipts from residuals are less as the result of the decreased value of coke and tar, but both the receipts from asphalting and fittings are up to the average. After paying income-tax, there is a balance of £7196 available for the payment of dividends. Out of this amount, the Directors recommend a payment of 6¼%, free from deduction of income-tax, which will absorb a sum of £1500. This will leave £5696 to be carried forward, or £53 more than the amount brought forward from the December accounts. It is gratifying to report that the Company have obtained a 5 years' contract for the public lighting of Malton, more especially as the electricity company have held the contract for 28 years.

STOCK AND SHARE LIST.

Official Quotations on the London and Provincial Stock Exchanges.

Issue. £	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Aug. 4.	Rise or Fall on Week.	Transactions. Lowest and Highest Prices During the Week.
1,551,868	Stk.	Apl. 3	7⅜	7	Alliance & Dublin Ord. ...	120—130	...	122—123½
374,000	"	July 10	4	4	Do. 4 p.c. Deb. ...	85—95	...	...
557,655	"	Mar. 6	7	7	Barnet Ord. 7 p.c.	157—162	...	...
300,000	1	May 8	1/4⅓	1/9⅔	Bombay, Ltd.	25/—27/-	...	...
178,280	Stk.	Feb. 20	9½	9½	Bournemouth sliding scale	195—205	...	...
550,050	"	"	7	7	Do. 7 p.c. max. ...	157—162	...	...
439,160	"	"	6	6	Do. 6 p.c. Pref. ...	137—142	...	138
50,000	"	June 26	3	3	Do. 3 p.c. Deb. ...	74—79	...	...
162,025	"	"	4	4	Do. 4 p.c. Deb. ...	99—104	...	...
210,000	"	"	5	5	Do. 5 p.c. Deb. ...	120—125	...	...
357,900	"	Mar. 6	7½	7½	Brighton, &c. 6 p.c. Con. ...	153—158	...	...
540,000	"	"	6½	6½	Do. 5 p.c. Con. ...	143—148	+1	...
195,500	"	"	6	6	Do. 6 p.c. B Pref.	133—138	...	...
1,487,500	"	July 24	5	5	Bristol 5 p.c. max.	108½—109½*a*	...	...
120,420	"	June 26	4	4	Do. 1st 4 p.c. Deb. ...	99—100*a*	...	...
217,870	"	"	4	4	Do. 2nd 4 p.c. Deb. ...	99—100*a*	...	...
328,790	"	"	5	5	Do. 5 p.c. Deb.	119—122*a*	...	...
855,000	"	Apl. 3	7	8	British Ord.	147—152	...	...
100,000	"	June 26	7	7	Do. 7 p.c. Pref.	145—150	...	...
350,000	"	"	5½	5½	Do. 5½ p.c. Pref. ...	108—113	...	...
120,000	"	"	4	4	Do. 4 p.c. Red. Deb. ...	94—99	...	...
450,000	"	"	5	5	Do. 5 p.c. Red. Deb. ...	103—113	...	...
160,000	"	June 26	5	5	Cambridge 5 p.c. Deb. ...	115—120	...	...
100,000	10	May 22	6	4	Cape Town, Ltd.	7—8	...	7½—7½
100,000	10	Apl. 24	4½	4½	Do. 4½ p.c. Pref. ...	6—7	...	...
150,000	Stk.	June 26	4½	4½	Do. 4½ p.c. Deb. ...	87—92	...	...
626,860	"	July 24	6	6	Cardiff Con. Ord.	117—122*	...	...
237,860	"	June 26	5	5	Do. 5 p.c. Red. Deb.	105—110	...	...
157,150	"	Feb. 20	5	6½	Chester 5 p.c. Ord.	107—112*b*	...	...
98,936	1	May 22	2/-	2/-	Colombo, Ltd. Ord.... ...	25/—30/-	...	...
24,500	1	"	1/4⅓	1/4⅓	Do. 7 p.c. Pref. ..	18/6 - 20/6	...	...
609,204	1	Mar. 20	/11'48	/11'48	Colonial Gas Assn. Ltd. Ord.	17/6—20/-	...	...
296,053	1	"	1/3'30	1/3'30	Do. 8 p.c. Pref.	1 1/16—1 3/16	...	...
1,796,955	Stk.	July 24	6½	5	Commercial Ord.	110—115*	...	...
475,000	"	June 12	3	3	Do. 3 p.c. Deb. ...	73—78	...	...
265,272	"	Mar. 6	—	5	Do. 5 p.c. Deb. ...	120—125	...	...
807,560	"	Feb. 20	7	7	Croydon sliding scale ...	145—150	...	148—149½
469,590	"	"	5	5	Do. max. div.	101—106	...	104½—106
500,000	"	July 10	5	5	Do. 5 p.c. Deb.	118—123	...	...
542,270	"	Mar. 6	7	10	Derby Con.	155—165*c*	...	...
55,000	"	July 10	4	4	Do. 4 p.c. Deb.	93—98*c*	...	...
209,000	"	Mar. 6	5	5	East Hull Ord. 5 p.c. ...	106—111	...	...
179,500	"	Mar. 6	6	6	East Surrey Ord. 5 p.c. ...	122—127	...	126
155,019	"	June 26	5	5	Do. 5 p.c. Deb. ...	117—122	...	...
1,002,180	"	Apl. 3	15	17	European, Ltd.	132—137	+1	134—137
19,373,992	"	Feb. 20	5⅞	5⅞	Gas Light & Coke 4 p.c. Ord.	25/9—26/9*f*	...	25/4½—26/6
2,600,000	"	"	8⅛	8⅛	Do. 8⅛ p.c. max. ...	84—87	...	84—84½
4,477,106	"	"	4	4	Do. 4 p.c. Con. Pref. ...	100—103	+1	101½—103
6,102,497	"	June 12	3	3	Do. 3 p.c. Con. Deb. ...	76—79	...	76½—77½
3,642,770	"	"	5	5	Do. 5 p.c. Red. Deb. ...	113—116	...	115½—116
3,500,000	"	"	4½	4½	Do. 4½ p.c. Red. Deb. ...	111—114	...	112
270,466	"	Mar. 6	6	6	Harrogate New Cons. ...	115—120	...	...
82,500	"	Mar. 6	7	7	Hastings & St. L. 5 p.c. Conv.	138—143	...	...
258,740	"	"	8½	8½	Do. 8½ p.c. Conv.	110—115	...	...
70,000	10	Apl. 24	10	10	Hongkong & China, Ltd. ...	14—15	...	...
213,200	Stk.	Mar. 6	6	6	Hornsey Con. 8½ p.c. ...	122—127	...	...
5,600,000	"	May 22	10	14	Imperial Continental Cap.	212—222	...	215—217½
223,130	"	Feb. 6	8½	8½	Do. 8½ p.c. Red. Deb.	89—94	...	91
235,242	"	Mar. 6	8½	8½	Lea Bridge 5 p.c. Ord. ...	170—175	...	...
2,145,907	"	Mar. 6	6	6	Liverpool 5 p.c. Ord. ...	125¼—126½*b*	...	...
245,500	"	June 26	5	5	Do. 5 p.c. Red. Pref. ...	103—113*b*	...	...
306,083	"	July 17	4	4	Do. 4 p.c. Deb. ...	99¼—101½*b*†	...	...
165,736	"	Feb. 20	8	10	Maidstone 5 p.c. Cap. ...	180—200	...	...
56,176	"	July 10	3	3	Do. 3 p.c. Deb. ...	69—74*	...	...
75,000	5	June 12	10	10	Malta & Mediterranean ...	9—11	...	...
392,000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	98—103	...	...
231,978	Stk.	Mar. 6	5	5	M. S. Utility "C." Cons. ...	103—108	...	...
818,657	"	"	4	4	Do. 4 p.c. Cons. Pref.	93—98	...	98
112,126	"	June 26	4	4	Do. 4 p.c. Deb. ...	100—102	...	101½
148,955	"	"	5	5	Do. 5 p.c. Deb. ...	113—118	...	...
675,000	"	21 May '31	16	16	Montevideo, Ltd.	55—65	...	57½—58½
2,061,315	"	Mar. 6	5	5½	Newcastle & Gateshead Con.	24/3—25/8*d*	—/3	...
682,856	"	"	4	4	Do. 4 p.c. Pref. ...	97—100*d*	—½	...
776,706	"	July 10	8½	8½	Do. 8½ p.c. Deb. ...	91—93*d*	...	...
277,285	"	May 8	5	5	Do. 5 p.c. Deb. '43...	107—109*d*	...	...
274,000	"	Feb. 20	5	5	Newport (Mon.) 5 p.c. max.	102—104*a*	...	...
204,940	"	Mar. 20	7½	7½	North Middlesex 6 p.c. Con.	147—152	+9½	...
396,160	"	Feb. 6	5	5	Northampton 5 p.c. max. ...	103—108	...	...
300,000	"	Apl. 24	9	7	Oriental, Ltd.	114—119	...	...
316,617	"	June 26	8	8	Plym'th & Stonehouse 5 p.c.	158—163	...	160
504,416	"	Feb. 20	8	8	Portsm'th Con. Stk. 4 p.c. Stk.	161—166	...	164—165
241,446	"	"	5	5	Do. 5 p.c. max. ...	104—109	...	104—106
114,000	"	Feb. 20	5	5	Preston 5 p.c. Pref.	103—108	...	...
686,312	"	July 24	4	4	Primitiva 4 p.c. Rd. Db. 1911	86—91*	+3	85—90
389,813	"	June 26	4	4	Do. 4 p.c. Cons. Deb.	82—87	...	...
150,000	10	Mar. 20	6	6	San Paulo 6 p.c. Pref. ...	6⅞—7⅛	...	...
1,736,968	Stk.	Sept. 5	6	6	Sheffield Cons.	127—130*e*	+2½	...
95,000	"	July 10	4	4	Do. 4 p.c. Deb.	90—94*e*	...	...
133,201	"	Feb. 20	8½	5	Shrewsbury 5 p.c. Ord. ...	125—130	...	...
90,000	10	June 12	15	14	South African	3—5	...	...
6,709,895	Stk.	Feb. 20	5	7	South Met. Ord.	127—132	...	129½—130½
1,135,812	"	"	6	6	Do. 6 p.c. Irred. Pf.	135—140	...	137½
850,000	"	"	—	20/-*g*	Do. 4 p.c. Irred. Pf.	99—103	...	...
1,895,445	"	July 10	8	8	Do. 8 p.c. Deb. ...	76—79	...	77—78
1 000,000	"	July 24	5	5	Do. 5 p.c. Red. Deb.	110—114*	...	112—112½
209,820	"	Mar. 6	8½	8½	South Shields Con.	149—151*d*	...	...
1,543,795	"	Feb. 20	6	6	South Suburban Ord. 5 p.c.	124—129	...	...
300,000	"	"	5	5	Do. 5 p.c. Pref.	113—118	...	114—115½
868,837	"	June 26	5	5	Do. 5 p.c. Deb.	118—123	...	121—121½
647,740	"	Feb. 20	5	5	Southampt'n Ord. 5 p.c. max.	107—112	...	...
121,275	"	June 26	4	4	Do. 4 p.c. Deb.	99—104	...	...
350,000	"	Mar. 6	9/-	5½	Swansea 5½ p.c. Red. Pref.	109—113	...	...
200,000	"	June 26	6½	6½	Do. 6½ p.c. Red. Deb.	103—108	...	...
1,076,490	"	Mar. 6	6½	6½	Tottenham and District Ord.	142—147	...	144—146
300,000	"	"	5½	5½	Do. 5½ p.c. Pref. ...	123—128	...	...
62,285	"	"	5	5	Do. 5 p.c. Pref. ...	110—115	...	...
199,005	"	June 12	4	4	Do. 4 p.c. Deb. ...	96—101	...	98½
85,701	"	Apl. 3	6	6	Tuscan, Ltd., 6 p.c. Red. Db.	80—85	...	...
347,769	"	Mar. 6	7	7	Uxbridge, &c., 5 p.c. ...	140—145	...	...
88,390	"	"	5	5	Do. 5 p.c. Pref. ...	110—115	...	113—114
1,322,220	"	July 10	7	7	Wandsworth Consolidated	143—148	+1	...
1,096,373	"	"	5	5	Do. 5 p.c. Pref.	113—118	...	...
1,317,964	"	June 26	5	5	Do. 5 p.c. Deb.	118—123	...	121½
158,400	"	Mar. 6	5	6*h*	Winchester W. & G. 5p.c. Con.	109—114	...	...

Quotations at:—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of stock. *g.*—For quarter. *h.*—Paid £3, including 10s. on account of back dividends. * Ex. div. † Paid free of income-tax. ‡ For year.

COMPANY NOTICES.

WINCHESTER WATER AND GAS COMPANY.

NOTICE is Hereby Given that the Directors have declared INTERIM HALF YEARLY DIVIDENDS as follows:—

(*a*) On the Preference Stocks at the rates of £4, £5, and £5 10s. per centum per annum, less Income Tax.

(*b*) On the Consolidated Ordinary Stock at the rate of £5 per centum per annum, less Income Tax.

(*c*) Warrants will be posted on the 31st August, 1933.

The ORDINARY and PREFERENCE STOCK REGISTERS WILL BE CLOSED from the 21st day of August to the 31st day of August, both days inclusive.

By order of the Board,
W. D. WALKER,
Secretary.

90, High Street,
Winchester.

THE UXBRIDGE, MAIDENHEAD, WYCOMBE, AND DISTRICT GAS COMPANY.

NOTICE is Hereby Given that the TRANSFER BOOKS of this Company so far as they relate to Capital (Ordinary and Preference) Stocks WILL BE CLOSED from the 17th to the 31st August, 1933, both days inclusive.

By order of the Board,
GEORGE J. BRISTOW,
Secretary.

Aug. 4, 1933.

BARNET DISTRICT GAS AND WATER COMPANY.

NOTICE is Hereby Given that the TRANSFER BOOKS of this Company relating to ORDINARY STOCK only WILL BE CLOSED on the 18th August, 1933, and RE-OPENED on 1st September, 1933.

By order of the Board,
E. D. DAVEY,
Secretary.

Offices:
139, Cannon Street,
London, E.C. 4,
Aug. 1, 1933.

TROTTER, HAINES, & CORBETT LIMITED
BRETTEL'S ESTATE
FIRE-CLAY & BRICK WORKS
STOURBRIDGE

Manufacturers of GAS RETORTS, GLASSHOUSE FURNACE & BLAST FURNACE BRICKS, LUMPS, TILES, and every Description of FIRE BRICKS.

Special Lumps, Tiles, and Bricks for Regenerative and Furnace Work.

SHIPMENTS PROMPTLY AND CAREFULLY EXECUTED.

LONDON OFFICE: E. C. BROWN & Co., LEADENHALL CHAMBERS, 4, ST. MARY AXE, E.C.

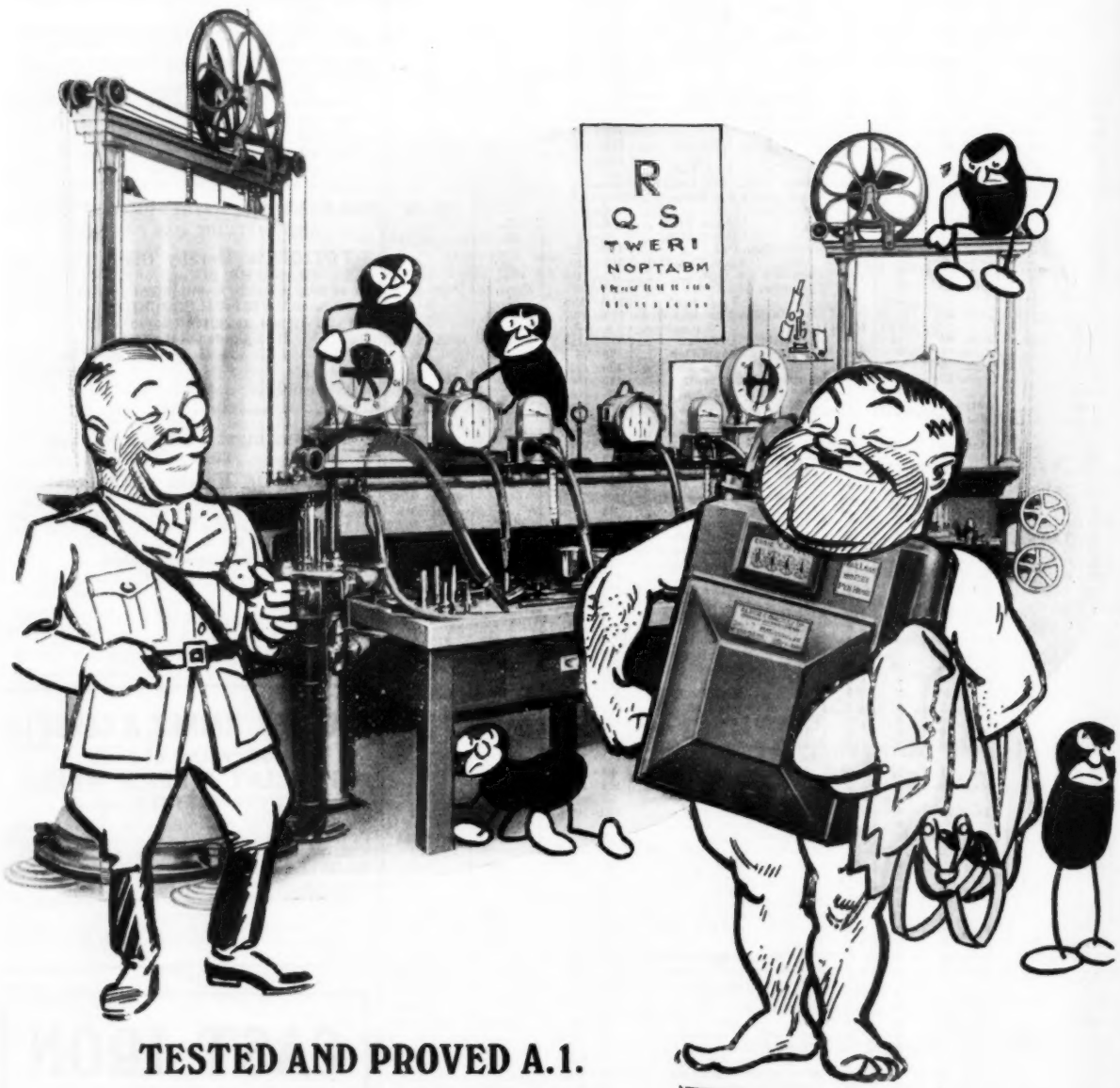
CAST IRON PIPES
FOR
GAS, WATER, & STEAM
1½in. to 12in. BORE.

THOS. ALLAN & SONS, LTD.,
Bonlea Foundry,
THORNABY-ON-TEES.

Telegrams: "BONLEA, THORNABY-ON-TEES."
Telephone No.: STOCKTON 66121 (Two lines).

A&M GAS-METERS

TRAIN-THE-THERMS



TESTED AND PROVED A.1.

Here you see Sergt. A. & M. Meters after having been passed A.1. and fit to continue controlling his therms at home or abroad. A fine specimen of efficiency and energy, his heart is sound and his pulse beats with mechanical accuracy Every therm knows that! The "would-be" dodger could have told the M.O. that the Sergt. was absolutely dependable. Have YOU given the Sergt. control of your therms.

METER TESTING EQUIPMENT

Alder & Mackay Ltd. are leading makers of Gas Meter Testing Equipment and will be very pleased to quote for their standard instruments or to individual specifications on request.

ALDER & MACKAY LIMITED

MAKE METERS OF METICULOUS MEASUREMENT

ALDER & MACKAY LTD., EDINBURGH, LONDON & BRANCHES.

PUBLISHERS' NOTICE.

TO CORRESPONDENTS: No notice can be taken of anonymous communications, unless authenticated by the name and address of the writer (not necessarily for publication).

TO ADVERTISERS.

NOON ON TUESDAY is the latest hour for receipt of advertisement copy for the following day's issue.

FIRST POST ON MONDAY is the latest for receipt of alterations of standing advertisements.

RATES FOR UNDISPLAYED ADVERTS: Situations Wanted, Six Lines and under (about 36 words), 3s.; each additional Line, 6d. Situations Vacant, Apparatus Wanted and for Sale, Contracts, Public Notices, &c., 9d. per Line—minimum 4s. 6d. An additional charge of 6d. is made where replies are addressed c/o the "JOURNAL."

Full Schedule of Advertising Rates on application.

TERMS OF SUBSCRIPTION.

United Kingdom and Ireland — Advance Rate { 35/- per annum. 18/- per half year. Credit Rate { 40/- per annum. 21/- per half year.

Dominions and Colonies ... 35/- per annum, in advance.

United States (through United States Agent) } $8.50 per annum, in advance.

Other Countries in the Postal Union. } 40/- per annum, in advance.

A copy of the "G.J." Calendar and Directory is presented to Continuous Subscribers.

UNITED STATES.—Renewals after December, 1931, and all new subscriptions in the United States, to be made through ROBERT O. LUQUEER, Agent, WOOLWORTH BUILDING, NEW YORK, N.Y.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C. 4.
Telephone: Central 2236-7 (2 lines). Telegrams: "GASKING, FLEET LONDON."

FRESH OXIDE

SPENT OXIDE

GAS PURIFICATION & CHEMICAL COMPANY LIMITED,

PALMERSTON HOUSE,
34, OLD BROAD STREET,
LONDON, E.C. 2.

(ESTABLISHED 1873.)

Telegrams: "PURIFICATION, STOCK, LONDON."
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16, DEANSGATE, MANCHESTER. PALACE CHAMBERS, WESTMINSTER, S.W.1.

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GAS PURIFYING MATERIAL.

Immediate delivery from STOCKS at:—Grangemouth, Middlesbrough, Goole, London, Poole, Newport and Garston.

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Telephones: Manchester: Blackfriars 3268 & 3269. London: Whitehall 6501.
Telegrams: Darwinian, Manchester. Darwinian Parl, London.

GEORGE WILSON GAS METERS, Ltd.
for
GAS-METERS, ORDINARIES, SLOTS, AND REPAIRS

Foleshill Road, COVENTRY.
'Phone: 3655 Coventry. Grams: "GASMETER."
Certus Works, Kingston Road, Raynes Park, LONDON, S.W.20.
Radium Works, 11, Radium Street, Oldham Road, MANCHESTER.

(*See advertisement July 19, p. 125.*)

PATENTS.

PATENTS for Inventions, Trade Marks "Advice Handbooks" and Consultations free. KING'S PATENT AGENCY LTD., Director B. T. KING, C.I.M.E., Regd. Patent Agent, G.B., U.S., and Can., 146A, QUEEN VICTORIA ST., E.C. 4, and 57, CHANCERY LANE (near Pat. Off.), LONDON, W.C. 2. 47 years' refs. 'Phone Cent. 0682.

MEWBURN, ELLIS, & CO.,

CHARTERED PATENT AGENTS AND TRADE MARK AGENTS,
70 & 72, Chancery Lane, London, W.C. 2.
Telegrams: "Patent, London." 'Phone: 243 Holborn.
And 3, St. Nicholas Buildings, Newcastle-on-Tyne.

J & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, LONDON, S.E. 1.

WET AND DRY GAS METERS, PREPAYMENT METERS, STATION METERS AND GOVERNORS.

REPAIRS RECEIVE PROMPT ATTENTION.

Telephones:
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Telegrams:
"BRADDOCK, OLDHAM," and "METRIQUE, LAMB, LONDON."

WEIGHBRIDGES

FOR Motor Lorries and Railway Traffic can be seen erected at our Works READY FOR DELIVERY. Inspection by your Engineer invited and a test by your Local Inspector of Weights and Measures before delivery. Every machine a High-Class Engineering Product and fully guaranteed.

CHARLES ROSS, LIMITED,
SHEFFIELD.

THE BRITISH GAS PURIFYING MATERIALS CO., LTD.,
99, LONDON ROAD, LEICESTER.

Telegrams: "BRIFURIMAT, LEICESTER." Telephone: LEICESTER 59086.

NATURAL BRITISH PURIFYING MATERIAL

AN ABSOLUTELY STANDARD PRODUCT.
MOISTURE GUARANTEED 28%
SUMMER AND WINTER.

"FIRST QUALITY" DUTCH BOG ORE

As supplied to most of the Principal Gas Works in Great Britain.

SPENT OXIDE PURCHASED.

OXIDE OF IRON.

SPENT OXIDE BOUGHT.

BALE & CHURCH, LTD.,
33, ST. MARY-AT-HILL, LONDON, E.C. 3.
Phone: Royal 1484.

"TORTO" FIRE CEMENT.

BALE & CHURCH, LTD.,
33, ST. MARY-AT-HILL, LONDON, E.C. 3.
Phone: Royal 1484.

"KLEENOFF," THE COOKER CLEANSER

Tins for Sale to Consumers.
In Bulk for Works Use.
(*See also the "Gas Salesman."*)

BALE & CHURCH, LTD.,
33, ST. MARY-AT-HILL, LONDON, E.C. 3.
Phone: Royal 1484.

CONTRACTS OPEN.

MARPLE URBAN DISTRICT COUNCIL.
(GAS DEPARTMENT.)

GAS PEAS, BEANS, SLACK, &c.

THE Gas Committee of the above Council invite TENDERS for the Supply of GAS PEAS, BEANS, SLACK, &c., as required at their Gas-Works, Marple Bridge, during the Twelve Months ending 31st August, 1934.

Forms of Tender and Conditions upon which Tenders only will be received may be obtained upon application to Mr. J. K. Law, Gas Engineer, Marple Bridge, near Stockport.

Tenders, endorsed "Coals," and addressed to the Chairman of the Gas Committee, to be delivered at the Council Offices, Marple, by Four o'clock in the afternoon on Saturday, the 26th August, 1933.

The Council do not bind themselves to accept the lowest or any Tender.

JAMES FREEMAN,
Clerk to the Council.

Council Offices,
Marple,
Cheshire,
Aug. 2, 1933.

APPOINTMENTS, &c., VACANT.

FLEETWOOD GAS COMPANY.

APPLICATIONS are invited for the Position of MANAGER. Applicants must have Experience of Management, and a thorough knowledge of Vertical Retorts, Water Gas Manufacture, Gas Distribution, and General Office Routine.

The Appointment will be subject to the Local Government and Other Officers' Superannuation Act, 1922, and the successful Candidate will be required to pass a Medical Examination.

Applications, endorsed "Manager," stating Age, giving full particulars of Experience and Salary required, and accompanied by *copies* of not more than Three recent Testimonials, must be sent to the undersigned so as to be received not later than Wednesday, August 16th, 1933.

P. MAYCOCK, F.C.I.S.,
Secretary.

Fleetwood Gas Company,
168, Lord Street,
Fleetwood, Lancs.

COUNTY BOROUGH OF DARLINGTON.
(GAS DEPARTMENT.)

APPLICATIONS are invited for a fully qualified and certificated LADY COOKERY DEMONSTRATOR, at a Salary of £180 per annum, rising, subject to satisfactory service, by annual instalments of £10 to £220 per annum.

She will be required to organize and give weekly lectures in Gas Cooking, instruct consumers at their homes in use of Gas Cookers, and assist, if necessary, in the Showrooms.

The appointment will be subject to the provisions of the Local Government and Other Officers' Superannuation Act, 1922.

Applications, stating Age (not over 40 years), Qualifications and Experience, with *copies* of two Testimonials, should be sent to the undersigned not later than noon August 25th, 1933.

H. HOPKINS,
Town Clerk.

Town Clerk's Office,
Darlington.

Continued on p. 312.

ROBERT DEMPSTER & SONS, Ltd., ELLAND, Builders of CARBONIZING PLANTS, both Horizontal and Vertical. Manufacturers of CONDENSERS, PURIFIERS, GASHOLDERS, &c., also every description of COAL and COKE HANDLING PLANT. Telegrams: "DEMPSTER, ELLAND." Telephone: ELLAND 261 (Private Branch Exchange).

FIRTH BLAKELEY, SONS, & CO., LTD.,

Vulcan Ironworks, Church Fenton, Yorks.,

MANUFACTURERS of Gasholders, Tanks, Condensers, Purifiers, Scrubbers, Washers, and every description of Gas Plant.

Telegrams: "BLAKELEYS, CHURCH FENTON." Telephone: BARKSTON ASH 34 (Private Branch Exchange). Code: "BENTLEYS."

STEAM ENGINES FOR GAS WORKS

ASHWORTH & PARKER,
Riverside Works, Bury, Lancs.
(See illustrated advertisement July 5, p. 13.)

APPOINTMENTS, &c., VACANT.
(Continued.)

COKING Plant Engineer and Operator Wanted to Supervise Bye-Product Plant during erection and starting-up.

Reference and Salary required to No. 8350, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

THE CITY OF STOKE-ON-TRENT.
(GAS DEPARTMENT.)

APPLICATIONS are invited for the Position of ASSISTANT GAS ENGINEER. Applicants must have had a thorough Technical Training and possess knowledge of Carbonizing in Vertical and Horizontal Retorts, with Modern Machinery, and have had Distribution Experience. It is essential that applicants be capable of assisting the Chief Gas Engineer in the preparation of plans and specifications. It would be an advantage if applicants have had experience in connection with the application of gas for industrial purposes, and also with the distillation of coal tar.

Salary £500 per annum inclusive, subject to temporary economy deduction of £17 10s. per annum now in force.

If the successful candidate gives satisfaction his position in the Department is likely to be improved.

Applications, containing particulars of Age (which must not exceed 45 years) and previous Experience, accompanied by *copies* of three recent Testimonials, to be delivered to the undersigned on or before Wednesday, the 6th September, 1933, marked "Assistant Gas Engineer."

Canvassing members of the Council, directly or indirectly, will be a disqualification, and this will be rigidly adhered to.

E. B. SHARPLEY,
Town Clerk.

Town Hall,
Stoke-on-Trent.

ADVERTISEMENT DEPARTMENT.

CAPABLE First Assistant required for Advertising Department of large Domestic Appliance Engineers. Applicant must have good practical Experience in all Branches of Advertising Work, and be capable of preparing copy and lay-outs unaided.

Reply, fully stating Age, Experience, and Salary required, to No. 8351, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

PLANT, &c., FOR SALE.

FOR SALE – Rotary Washer Scrubber —Holmes Patent. Capacity 625,000 Cu.Ft. per day, 5 Chambers each 6 ft. 9 in. diam., with 2 18-in. Westwood & Wright's Valves, driven by Horizontal Steam Engine. Previously used for Benzole Extraction. Good Condition.

LEA BRIDGE DISTRICT GAS COMPANY, GAS-WORKS, LEYTON, E. 10.

HEMP GRUMMETS
Millions Sold Ask for Samples
A. WITHINSHAW
HELLIER STREET, DUDLEY, WORC.

BUFFALO INJECTOR
(British Made) CLASS A
— FOR —
Hot or Cold Water and long lifts.

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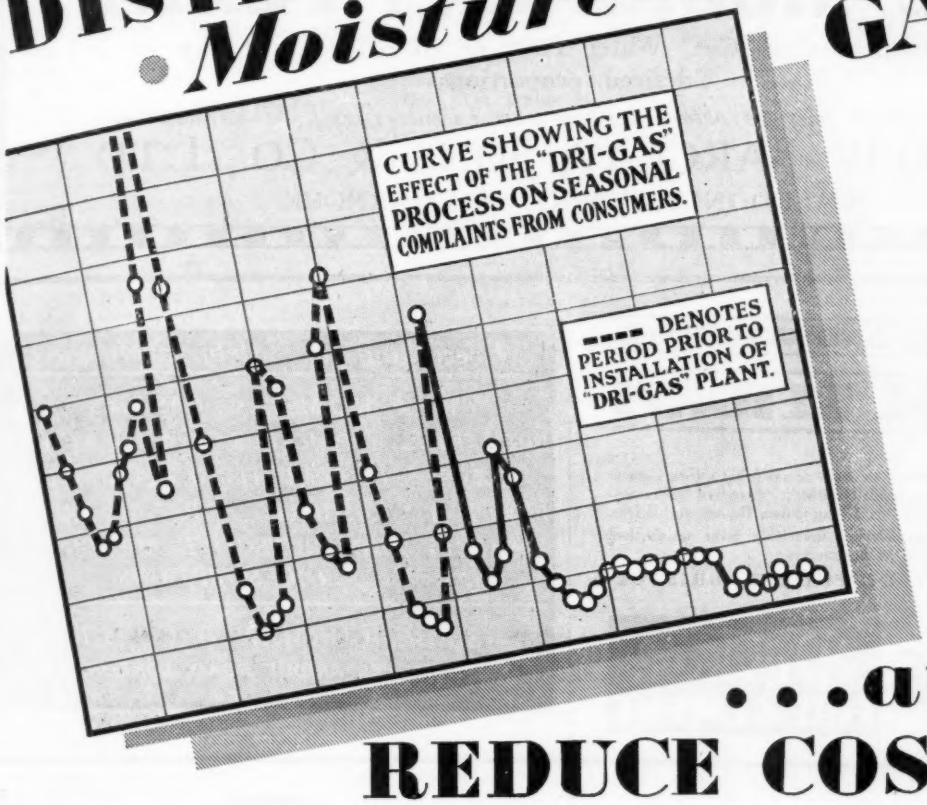
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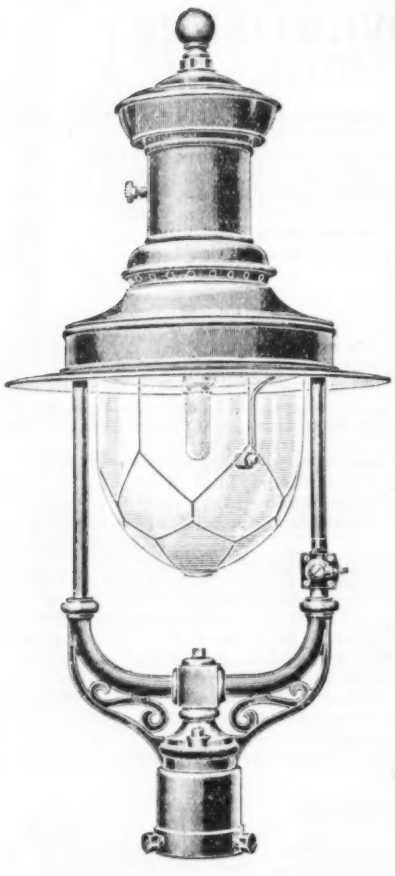

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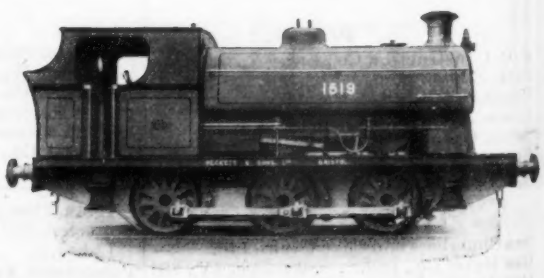

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